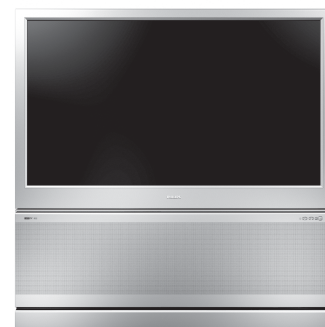


Service Service Service



Service Manual

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1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

- 1.1 Technical Specifications
- 1.2 Connection Overview
- 1.3 Chassis Overview

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

1.1 Technical Specifications

1.1.1 Vision

Display type	: 3 x CRT,
Screen size	: Rear Projection TV
	: 51" (129.5 cm), 16:9
	: 60" (152.5 cm), 16:9
Resolution (Hor. Res.)	: > 1000 lines
Viewing angle (HxV degrees)	: 160x30
Tuning system	: PLL
TV Colour systems	: ATSC
	: NTSC M/N 3.58
	: Clear QAM
Video playback	: NTSC M/N 3.58, 4.43
	:
Supported video formats	: 640x480i - 1fH
	: 640x480p - 2fH
	: 1920x1080i - 2fH
Presets/channels	: 181, Full-Cable
Tuner bands	: VHF
	: UHF
	: S-band
	: Hyper-band

1.1.2 Sound

Sound systems	: FM-mono
	: AV Stereo
	: AC-3 Dolby Digital
	: BTSC
Maximum power (W_{RMS})	:
51 inch	: 2 x 5
60 inch	: 2 x 10

1.1.3 Miscellaneous

Power supply:	
- Mains voltage (V_{AC})	:
51 inch	: 90 - 140 / 110
60 inch	: 90 - 140
- Mains frequency (Hz)	: 60
Ambient conditions:	
- Temperature range (°C)	: +5 to +40
- Maximum humidity	: 90% R.H.
Power consumption (values are indicative)	
- Normal operation (W)	: ≈ 255
- Stand-by (W)	: < 1
Dimensions (WxHxD cm)	:
51 inch	: 125 x 140 x 62
60 inch	: 143.5 x 150.7 x 68.3

Weight (kg)	:
51 inch	: 83.7
60 inch	: 87

1.2 Connection Overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

1.2.1 Front / Side Connections



Figure 1-1 Front and Side I/O

1.2.2 Rear Connections

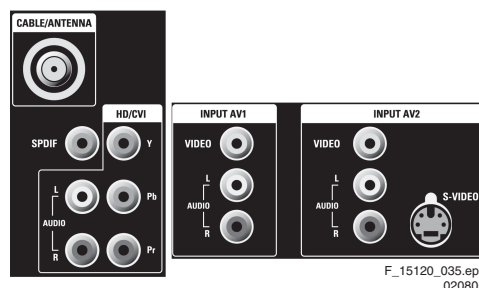


Figure 1-2 Rear I/O

Aerial - In

- F-type (US) Coax, 75 ohm



Cinch: Video CVBS - In, Audio - In

Ye - Video CVBS 1 V_{PP} / 75 ohm
 Wh - Audio L 0.5 V_{RMS} / 10 kohm
 Rd - Audio R 0.5 V_{RMS} / 10 kohm



Cinch: Video YPbPr - In

Gn - Video Y 1 V_{PP} / 75 ohm
 Bu - Video Pb 0.7 V_{PP} / 75 ohm
 Rd - Video Pr 0.7 V_{PP} / 75 ohm



SVHS (Hosiden): Video Y/C - In

1 - Ground Y Gnd
 2 - Ground C Gnd
 3 - Video Y 1 V_{PP} / 75 ohm
 4 - Video C 0.3 V_{PP} / 75 ohm



HDMI: Digital Video, Digital Audio - In

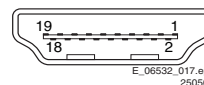


Figure 1-3 HDMI (type A) connector

1 - D2+ Data channel
 2 - Shield Gnd
 3 - D2- Data channel



4 - D1+	Data channel	⊕	18 - +5V		⊕
5 - Shield	Gnd	⊕	19 - HPD	Hot Plug Detect	⊕
6 - D1-	Data channel	⊕	20 - Ground	Gnd	⊕
7 - D0+	Data channel	⊕			
8 - Shield	Gnd	⊕			
9 - D0-	Data channel	⊕			
10 - CLK+	Data channel	⊕			
11 - Shield	Gnd	⊕			
12 - CLK-	Data channel	⊕			
13 - n.c.					
14 - n.c.					
15 - DDC_SCL	DDC clock	⊕			
16 - DDC_SDA	DDC data	⊕			
17 - Ground	Gnd	⊕			

Service Connector (ComPair)					
1 - SDA-S	I ² C Data (0 - 5 V)	⊕			⊕
2 - SCL-S	I ² C Clock (0 - 5 V)	⊕			⊕
3 - Ground	Gnd	⊕			⊕

Cinch: S/PDIF - Out					
Bk - Coaxial	0.4 - 0.6V _{PP} / 75 ohm	⊕			⊕

1.3 Chassis Overview

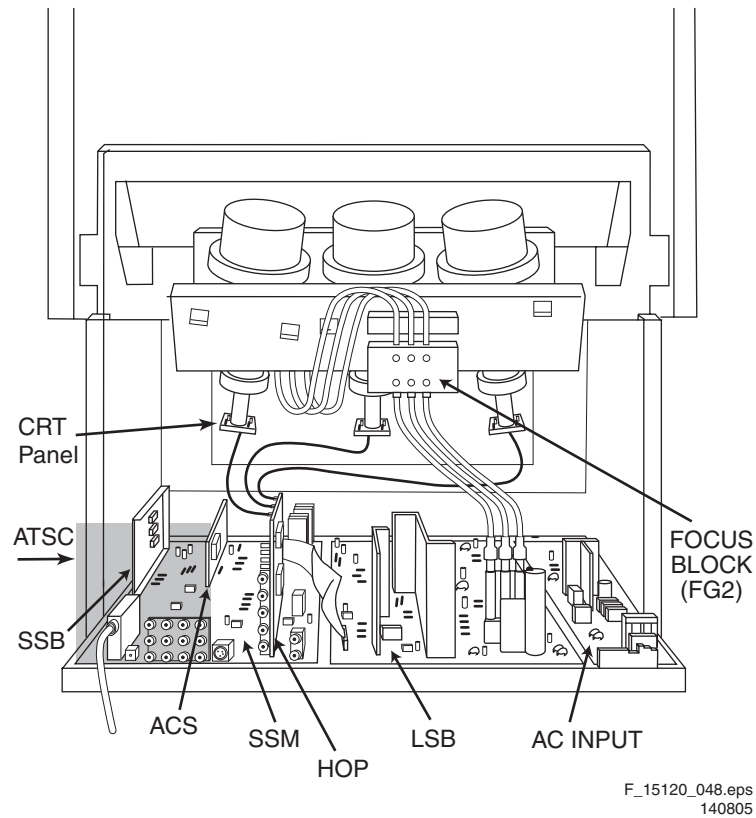


Figure 1-4 PWB locations

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

- 2.1 Safety Instructions
- 2.2 Maintenance Instructions
- 2.3 Warnings
- 2.4 Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:

- Due to the chassis concept, a very large part of the circuitry (incl. deflection) is 'hot'. Therefore, connect the set to the mains via an isolation transformer.
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.
- Wear safety goggles when you replace the CRT.

Safety regulations require that **after** a repair, you must return the set in its original condition. Pay, in particular, attention to the following points:

- General repair instruction: as a strict precaution, we advise you to re-solder the solder connections through which the horizontal deflection current is flowing. In particular this is valid for the:
 1. Pins of the line output transformer (LOT).
 2. Fly-back capacitor(s).
 3. S-correction capacitor(s).
 4. Line output transistor.
 5. Pins of the connector with wires to the deflection coil.
 6. Other components through which the deflection current flows.

Note: This re-soldering is advised to prevent bad connections due to metal fatigue in solder connections, and is therefore only necessary for television sets more than two years old.

- Route the wire trees and EHT cable correctly and secure them with the mounted cable clamps.
- Check the insulation of the mains cord for external damage.
- Check the strain relief of the mains cord for proper function, to prevent the cord from touching the CRT, hot components, or heat sinks.
- Check the electrical DC resistance between the mains plug and the secondary side (only for sets that have an isolated power supply). Do this as follows:
 1. Unplug the mains cord and connect a wire between the two pins of the mains plug.
 2. Turn on the main power switch (keep the mains cord unplugged!).
 3. Measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection of the set. The reading should be between 4.5 MΩ and 12 MΩ.
 4. Switch the TV 'off' and remove the wire between the two pins of the mains plug.
- Check the cabinet for defects, to prevent the possibility of the customer touching any internal parts.

2.2 Maintenance Instructions

We recommend a maintenance inspection carried out by qualified service personnel. The interval depends on the usage conditions:

- When a customer uses the set under normal circumstances, for example in a living room, the recommended interval is three to five years.
- When a customer uses the set in an environment with higher dust, grease, or moisture levels, for example in a kitchen, the recommended interval is one year.

- The maintenance inspection includes the following actions:
 1. Perform the 'general repair instruction' noted above.
 2. Clean the power supply and deflection circuitry on the chassis.
 3. Clean the picture tube panel and the neck of the picture tube.

2.3 Warnings

- In order to prevent damage to ICs and transistors, avoid all high voltage flashovers. In order to prevent damage to the picture tube, use the method shown in Fig. 2-1, to discharge the picture tube. Use a high voltage probe and a multi-meter (position V_{DC}). Discharge until the meter reading is 0 V (after approx. 30 s).

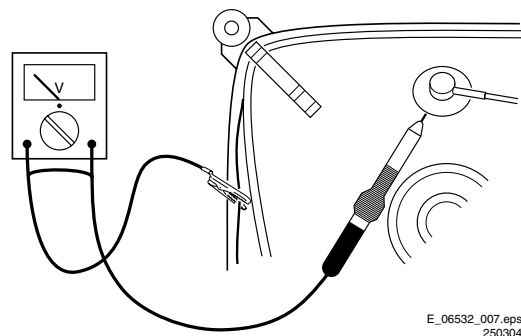


Figure 2-1 Discharge picture tube

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD, ▲). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this potential. Available ESD protection equipment:
 - Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and ground cable) 4822 310 10671.
 - Wristband tester 4822 344 13999.
- Together with the deflection unit and any multi-pole unit, flat square picture tubes form an integrated unit. The deflection and the multi-pole units are set optimally at the factory. We do not recommend adjusting this unit during repair.
- Be careful during measurements in the high voltage section and on the picture tube.
- Never replace modules or other components while the unit is 'on'.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.4 Notes

2.4.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (⊥), depending on the tested area of circuitry.
- The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz (PAL) or 61.25 MHz (NTSC, channel 3).

- Where necessary, measure the waveforms and voltages with (⏏) and without (⏏) aerial signal. Measure the voltages in the power supply section both in normal operation (Ⓢ) and in standby (Ⓢ). These values are indicated by means of the appropriate symbols.
- The picture tube panel has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

- Manufactured under license from Dolby Laboratories. 'Dolby', 'Pro Logic' and the 'double-D symbol', are trademarks of Dolby Laboratories.



Figure 2-2 Dolby PL symbol

3. Directions for Use

You can download this information from the following websites:

<http://www.philips.com/support>

<http://www.p4c.philips.com>

4. Mechanical Instructions

Index of this chapter:

- 4.1 Disassembly Procedures
- 4.2 Service Position
- 4.3 Picture Tube Replacement
- 4.4 Set Re-assembly

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassembly instructions in described order.

4.1 Disassembly Procedures

All numbers, found in the following text, refer to the drawing below and apply to both the 43" and 55" models.

Note:

- Not all shown items are available for all models.
- If you are servicing a PWB or speaker, you do not need to remove the plastic Upper Back Cover (4).

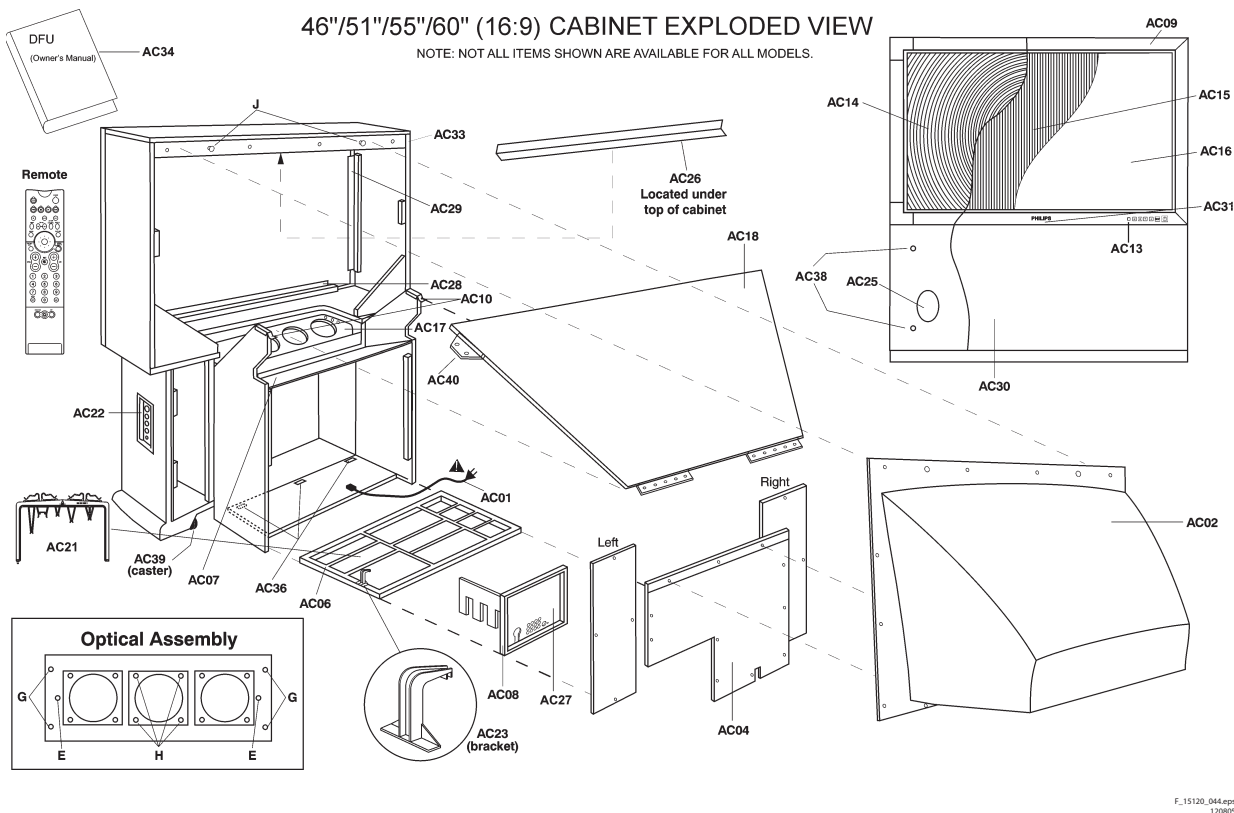


Figure 4-1 Exploded view 51" cabinet

4.1.1 Lower Center Back Cover Removal (86)

1. Remove all screws (B and C).
2. Remove the Lower Center Back Cover.

4.1.2 Side Back Cover Removal

Remove all screws (F) from each of the Side Back Covers (some prying may be necessary to dislodge covers).

Note: This allows access to the Side Jack Panel and to the Left and the Right Speakers.

4.1.3 Large Signal Board Removal (LSB)

Note: See for the location of the **panels** figure "PWB location" in Chapter 1 "Technical Specifications, Connection Facilities, and Chassis Overview".

1. Disconnect all cables.
2. Remove three screws from the center of the PWB and pull three tabs on the right of the bracket.
3. Lift the right side of the LSB and slide the panel up and out.

4.1.4 AC Input Panel Removal

1. Disconnect all cables.
2. Remove four screws from the PWB.
3. Lift the AC Input Panel up and out.

4.1.5 Small Signal Module Removal (SSM)

1. Remove three screws along the rear of the chassis frame.
2. Remove two screws, which hold the chassis frame and are located between the LSB and SSB panels.
3. Remove one screw, which holds the chassis frame and is located between the Input Power and LSB panels.
4. Remove the rear Jack Panel cover (76).
5. Slide the Chassis assembly rearward to allow access to the Module Bracket.
6. Remove the screws, which secure the Module Bracket, and release the cables.
7. Remove two screws from the centre of the SSM PWB.
8. Pull three tabs on the right of the panel bracket.
9. Lift the right side of the SSM, then move the SSM to the right to remove it.

4.1.6 Side Jack Panel Removal

1. Remove the Left Side Back Cover (see procedure above excluding the Module Bracket removal).
2. Remove two screws from the panel.
3. Slide the Side Jack Panel PWB out of the bracket.

4.1.7 PIP Panel Removal (if present)

1. Remove the rear Jack Panel cover (76).
2. Remove three screws from the PIP panel.

4.1.8 Small Signal Board Removal (SSB)

First, remove the Module Bracket (see the chapter "Small Signal Module Removal").

1. Release the metal retainer clips, located at the front and rear edges of the SIMM connector.
2. Tilt the SSB to the right and then pull it up.

4.1.9 Convergence Panel Removal (ACS)

First, remove the Module Bracket (see the chapter "Small Signal Module Removal").

1. Carefully pull the ACS panel upward to separate it from the SSM connectors.
2. Disconnect the cable assemblies.

4.1.10 Wide Band Video Panel Removal (HOP)

First, remove the Module Bracket (see the chapter "Small Signal Module Removal").

1. Remove the rear Jack Panel cover (76).
2. Disconnect the ribbon cable connectors.
3. Carefully separate the HOP panel from the SSM connectors.

4.1.11 Front Control Panel and Left or Right Speaker Removal (5)

1. Remove the Left and Right Side Back Covers.
2. Remove the two screws (on either side) of the speaker location.
3. Release two tabs on either side of the speaker baffle and pull the baffle forwards.
4. Loosen the ribbon cable and the grounding wire to allow working space.
5. Remove two screws to remove the Front Control Panel (4527).
6. Remove four screws each to remove the speakers (5208/5206).

4.1.12 Upper Back Cover Removal (4)

1. Remove all screws (A and B).
2. Lift the cover up to dislodge from pegs (J) and remove the cover.

4.1.13 Plastic Light Barrier Removal (Optical Assembly)

Remove two screws (E) (one each at either end of the plastic light barrier).

4.1.14 Mirror Mounting Board Removal (57)

Remove all screws, located in the mirror mounting board brackets, and remove the board.

Note: Take care **not** to place fingerprints or smudges on the mirror.

4.1.15 Complete Optical Assembly or Individual CRT Assembly Removal

1. Remove the Plastic Light Barrier.
2. Disconnect the CRT panels, 2nd anode leads (at HVT), and the yoke connectors from assemblies to be removed.
3. To remove the complete Optical Assembly, remove four screws (G) and lift the assembly up and out.
4. To remove individual CRT assemblies, remove four screws (H) from the desired assembly and lift the assembly up and out.

Caution: Do not disturb the focus assembly wing nuts, as this will misadjust mechanical focus.

4.2 Service Position

1. Remove the Side Back Covers.
2. Remove the Front Speaker Baffle.
3. Remove the Front Control Panel.
4. Route the ribbon cable and the wire through opening and into the back of the unit.
5. Reconnect the ribbon cable to the Front Control Panel.
6. Remove the Side Jack Panel to allow room for cable movement.
7. Remove the rear Jack Panel cover (76).
8. Being careful with the PIP Panel, pull the Chassis Frame out and tilt up.
9. Place the Chassis Frame on the bottom board of the PTV.

4.3 Picture Tube Replacement

Replacement of the cathode ray tube (CRT) and/or optical system components of a Projection TV (PTV) can be easily accomplished by following general guidelines. Use care when working around the CRT and optical systems of the PTV. The PTV light path encompasses a number of precision optical components. These include lenses, mirrors, the lenticular screen, and Fresnel lens. The PTV incorporates three separate CRTs, representing green, red, and blue outputs. Each CRT uses an independent deflection/convergence yoke, magnetic centring ring, coupler, C-element lens, and output lens (A/B lens). Each tube is mechanically fastened to a coupler which houses fluid (a glycol-type substance) used to cool the high temperatures generated by the small (7") CRTs. The fluid also provides an optical characteristic supporting the optical system of the PTV. When replacement of a CRT or optical component is required, caution must be exercised in preventing fluid spillage. The technician must carefully reassemble the CRT/optical components, ensuring a proper seal of the coupling fluid. Use only factory original coupling fluid.

Caution: Do not use or add water as an alternative to the prescribed coupling fluid.

Note: Upon completion of CRT/optical assembly repair, the centring, convergence, grey scale, mechanical and electrical focus adjustments are required. If more than one assembly requires repair, it is recommended the service technician fully complete one assembly at a time, using the existing assemblies as a reference for the alignment of the centring and convergence.

The following procedure should be used when performing repairs on the CRT/optical assemblies of the Projection TV.

4.3.1 Disassembly Procedure**A. Removal of a single CRT/Lens Assembly from the light rack**

1. Remove AC power from the PTV.
2. Remove the upper and lower back covers (1/4" screws).

3. Remove the barrier board and the shield cover from around the lens assemblies (1/4" screws).
4. Carefully remove the CRT Socket Board from the CRT of the CRT/optical assembly being serviced.
5. Remove the yoke and convergence plugs, of the CRT/optical assembly being serviced, from the Large Signal Module.
6. Remove the high voltage anode lead from the HV splitter block on the Large Signal Module of the CRT/optical assembly being serviced. Remove ground lug connectors from the coupler frame.
7. Remove the four 1/4" screws that secure the CRT/lens assembly to the light rack. These four screws are located in each corner, on the top of the coupler assembly.
Caution: Do not remove the bolts with pressure springs or the inverted Torx screws of the CRT/lens assembly. The removal of these components could result in fluid spillage into the PTV cabinet.
8. Carefully remove the CRT/Lens assembly from the PTV cabinet.

4.3.2 Servicing the CRT/Lens Assembly

Warning: Coupling fluid is a poisonous solution containing a high concentration of ethylene glycol. Do not leave exposed fluid unattended. Prevent children or pets from coming into contact with the fluid. Clean up spills immediately.

Caution: Do not attempt any repairs on the CRT/optical block assembly without first removing the CRT coupling fluid. Removal of the delta output lens will result in spillage of the coupling fluid.

B. Removing the PTV Coupling Fluid

All repairs made to the CRT/optical block assembly require the removal of the coupling fluid. The following procedure describes how to remove the PTV coupling fluid.

1. Lay the CRT assembly on its side with the plug pointing up.
2. Remove the plug (X8).
3. Remove some of the fluid from the coupler to prevent spillage when the CRT is removed. An empty coupling fluid bottle with a cone top is recommended to lower the fluid level within the coupler. Squeeze and hold the bottle and insert the tip of the cap into the drain hole of the coupler. Loosen the grip on the bottle, allowing the fluid to be pulled up into the bottle. Save the fluid.
4. Reinstall the plug (X8).
5. Stand the CRT assembly up with the neck of the CRT pointing up.
6. With an awl or marking pen, outline the edges of the CRT onto the coupler.
Note: The correct positioning of the CRT to the coupler is critical to the optimum performance of the optical system.
7. Remove the four CRT mounting bolts (A) (with springs and spacers) and remove the mounting bracket (D).
8. Remove the four CRT mounting ear screws.
Note: The CRT mounting ear screws are not used on some assemblies.
9. Gently remove any metal shavings from around the screw holes. Do not allow the metal shavings to get into the fluid. Note the position of the high voltage anode cap with respect to the coupler.
10. Carefully remove the CRT from the coupler. Wipe any excess fluid from the faceplate of the CRT. Set the CRT aside.
11. Use an empty coupling fluid bottle to extract the remainder of the fluid from the coupler.
Note: Complete removal of the coupling fluid is not necessary when only replacing the CRT.
12. Clean any remaining fluid from the coupler and the CRT gasket channel using absorbent tissue. Refer to "C". Cleaning the Coupler, C-element Lens, and CRT Faceplate procedure if the fluid is discoloured or contaminated.

13. Make all necessary repairs.

C. Cleaning the Coupler, C-Element Lens, and CRT Faceplate

1. Remove CRT coupling fluid as described in steps B1 through B13.
2. Using denatured alcohol on a cloth made of 100% cotton or a lens cleaning tissue, gently clean the C-element (fisheye) lens, coupler and the CRT faceplate. Thoroughly clean the coupler assembly, including the expansion chamber bladder, and allow to fully dry.
Caution: Do not use soap or detergent type substances to clean the coupler and its related assemblies. Water can be used as an alternative to denatured alcohol, but the assemblies must be completely dry before reassembly of the coupler and the addition of the coupling fluid. A hair dryer may be used to dry the coupler and its assemblies before reassembly. If contaminated fluid is discovered, the coupler and its related assemblies must be completely disassembled and cleaned to prevent a recurrence.
3. Replace the CRT and C-element lens gaskets.
4. Reassemble the C-element lens and the output lens to the coupler.
5. Refer to "Replacing the CRT Coupling Fluid" upon completion of necessary repairs and cleaning of the optical/coupler assemblies.

D. Replacement of the CRT

1. Remove CRT coupling fluid as described in steps B1 through B13.
2. Remove the plastic protective coating (if present) from the faceplate of the replacement CRT.
3. Refer to "Replacing the CRT Coupling Fluid" to complete the CRT replacement.

E. Repair or Replacement of the Optical/Coupler Assembly

1. Remove CRT coupling fluid as described in steps B1 through B13.
2. Remove the four inverted-type Torx screws, which secure the Delta output lens to the coupler. An inverted-type Torx socket can be purchased using part number 4835 395 17303.
3. Removal of the Delta output lens will allow access to the C-element lens, C-element gasket, coupler, and its assemblies.
4. Refer to "Replacing the CRT Coupling Fluid" upon completion of necessary repairs to the optical/coupler assemblies.

F. Replacing the PTV Coupling Fluid

Notes:

- Before replacing the CRT coupling fluid, ensure the expansion chamber bladder is fully collapsed. This can be easily inspected by viewing the bladder through the small hole on the expansion chamber assembly. If the rubber of the bladder is not easily visible through the small hole, then the bladder may be considered collapsed and fluid can be added. If the rubber of the expansion chamber bladder is visible at the hole of the expansion chamber, then replacement of the expansion chamber bladder is required.
 - The CRT coupling fluid is critical to the optical performance of the PTV. Use only part number 4835 310 67032 (3 bottle kit) or 4835 310 67031 (1 bottle) to ensure the optical integrity and performance reliability of the PTV when replacing the CRT coupling fluid.
1. Reinstall the CRT gasket into the gasket channel of the coupler. Confirm the placement of the CRT, C-element lens, and vent plug gaskets.
 2. Place the CRT onto the coupler with the high voltage anode lead positioned as marked in step 10 of procedure B.
 3. Carefully position the CRT onto the coupler, using the outline defined in step 6 of procedure B as a reference.

4. Start the CRT mounting ear screws but do not tighten them.
5. Tighten the CRT mounting ear screws in a star pattern (like tightening lug nuts on the wheel of a car). Make sure the CRT does not shift position from the outline defined in step B6.
Caution: do not over tighten the CRT ear screws (the CRT mounting ear screws are not used on some assemblies).
6. Install the CRT mounting bracket and start the four CRT mounting bracket bolts with springs.
7. Tighten the bolts in a star pattern.
8. Lay the CRT assembly on its side with the plug pointing up.
9. Remove the plug.
10. Using the PTV coupling fluid bottle with the cone top, refill the coupler with fluid through the drain access hole.
Completely fill the coupler chamber so the fluid is level with the top of the coupler at the plug. Wipe any excess fluid from around the coupler.
11. Reinstall the plug and check for any fluid leaks.
12. Install the repaired CRT/optical block assembly into the PTV and perform any necessary adjustments.

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Note: While re-assembling, make sure that all cables are placed and connected in their original position

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- 5.1 Test Conditions
- 5.2 Service Modes
- 5.3 Problems and Solving Tips (related to CSM)
- 5.4 ComPair
- 5.5 Error Codes
- 5.6 The "Blinking LED" Procedure
- 5.7 Trouble Shooting Tips

5.1 Test Conditions

The chassis is equipped with test points printed on the circuit board assemblies. They refer to the diagram letters. The numbering is in a logical sequence for diagnostics. Always start diagnosing (within a functional block), in the sequence of the relevant test points for that block.

Measurements should be performed under the following conditions:

- Service Default Mode.
- Video: Colour Bar Signal.
- Audio: 3 kHz left, 1 kHz right.

5.2 Service Modes

Service Default Mode (SDM) and Service Alignment Mode (SAM) offer several features for the service technician, while the Customer Service Mode (CSM) is used for communication between a Philips Customer Care Centre (P3C) and a customer.

There is also the option of using ComPair, a hardware interface between a computer (see requirements below) and the TV chassis. It offers the ability of structured troubleshooting, test pattern generation, error code reading, software version readout, and software upgrading.

Minimum requirements: a Pentium processor, Windows 95/98, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Introduction

The Service Default Mode (SDM) is a technical aid for the service technician. The Service Default Mode (SDM) establishes fixed, repeatable settings of customer controls, which allow consistent measurements to be made. The SDM also initiates the blinking LED procedure and, if necessary, overrides the 5 V protection.

The SDM places the set in the following pre-defined conditions:

- Tuning frequency set to 475.25MHz.
- Volume level set to 25% (of the maximum volume level).
- Other picture and sound settings set to 50% (mid-range).

The following functions are turned OFF while in SDM:

- Timer
- Sleep timer

The following functions are disabled during SDM (and enabled after leaving SDM):

- Parental lock
- Blue mute
- Hospitality Mode
- No-ident Timer (normally the set is automatically switched off when no video signal (IDENT) is received for 15 minutes).

All other controls operate normally.

How to enter SDM

To enter the Service Default Mode, press the following key sequence on the remote control transmitter
"0-6-2-5-9-6"-MENU. Do not allow the display to time out between entries while keying the sequence.
Upon entry into the Service Default Mode, the letters "SDM" will be displayed at the upper right corner of the screen.

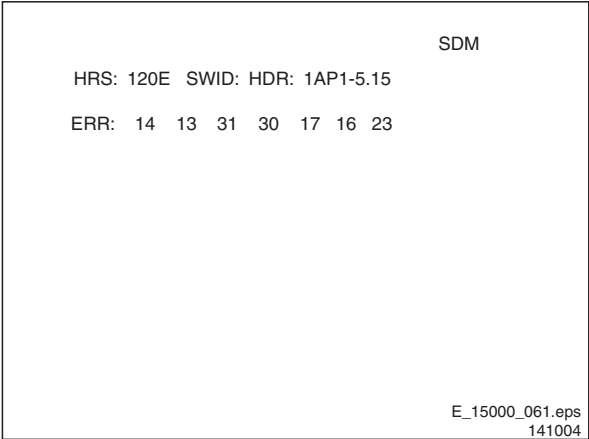


Figure 5-1 SDM menu

Special SDM functions

- Access to normal user menu: Pressing the "MENU" button on the remote control switches between the SDM and the normal user menus (with the SDM mode still active in the background).

How to exit SDM

To exit the Service Default Mode, press the Power (standby) button.

Note: To save the error codes, unplug the AC power cord without turning off the set. When the power is turned back on, the Service Default Mode will still be active.

5.2.2 Service Alignment Mode (SAM)

The Service Alignment Mode (SAM) is used to align the set and/or adjust the option settings and to display/clear the error code buffer values.

How to enter SAM

- To enter the Service Alignment Mode (SAM), press the following key sequence on the remote transmitter: **"0-6-2-5-9-6"-[i+]**. Do not allow the display to time out between entries. After entering SAM with this method a service warning will appear on the screen, you can continue by pressing any digit key on the RC.
- Use the DST-emulation feature of ComPair.
- Press the ALIGN button on the DST while the set is in the normal operation

After entering this mode, "SAM" the following menu structure will appear on the screen:

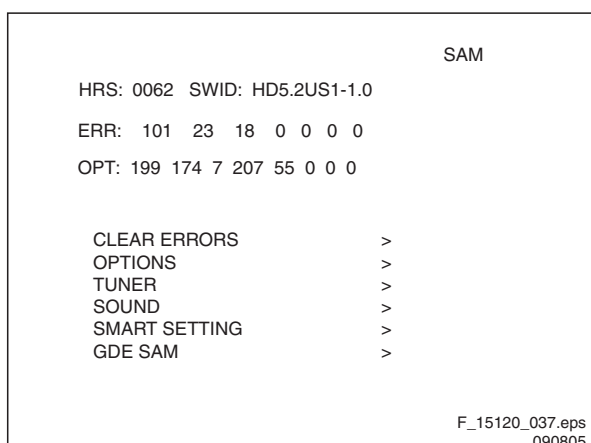


Figure 5-2 SAM menu

Contents of SAM

- **OPERATION HOURS.** Displays the accumulated total of operation hours (not the standby hours).
- **SOFTWARE INFO**
 - **SWID** Displays the SW version of the software.
example: HD5.2US1-1.00
 - **AP1** = 2 letter and 1 digit combination to indicate the software type and supported languages:
 - **AP** = Asian Pacific.
 - **1** = Main SW language version number.
 - **5.15** = Sub version number.
- **ERRORS** (followed by maximal 7 errors). The most recent error is displayed at the upper left (for an error explanation see paragraph "Error Codes").
- **OPTION BYTES.** See chapter 8.
- **SUB MENU**
 - Clear Errors
 - Erases the contents of the error buffer. Select the CLEAR ERRORS menu item and press the LEFT or RIGHT cursor key. The contents of the error buffer are cleared.
 - The functionality of the OPTIONS and ALIGNMENTS (TUNER, WHITE TONE, GEOMETRY, SOUND, and SMART SETTING) sub-menus are described in the service adjustments.
 - The functionality of the OPTIONS and ALIGNMENTS (TUNER, WHITE TONE, GEOMETRY, SOUND, and SMART SETTING) sub-menus are described in the service adjustments.

How to navigate

Menu items may be selected using the cursor UP/DOWN keys. The selected item will be highlighted.

When not all menu items will fit on the screen, pressing the cursor UP/DOWN keys on the remote transmitter will display the next/previous menu items.

With the cursor LEFT/RIGHT keys, it is possible to:

- Activate/deactivate the selected menu item (e.g. TUNER)
- Change the value of the selected menu item (e.g. VER-SLOPE)
- Activate the selected submenu (e.g. SERV-BLK)

Access to normal user menu

Pressing the "MENU" button on the remote control switches between the SAM and the normal user menus (with the SAM mode still active in the background). Pressing the "MENU" key in a submenu will return the screen to the previous menu.

Menu and Sub-menu Definitions

Clear Errors: Erases the contents of the error buffer. Select the CLEAR ERRORS menu item and press the LEFT or RIGHT cursor key. The contents of the error buffer are cleared.

The functionality of the OPTIONS and ALIGNMENTS (TUNER, WHITE TONE, GEOMETRY, SOUND, and SMART SETTING) sub-menus are described in the "Alignments" section (chapter 8).

How to exit SAM

To exit the Service Alignment Mode, press the Power (Standby) button.

Note: To save the error codes, unplug the AC power cord without turning off the set. When the power is turned back on, the Service Alignment Mode will still be active.

5.2.3 Customer Service Mode (CSM)**Purpose**

When a customer is having problems with his TV-set, he can call his dealer. The service technician can then ask the customer to activate the CSM, in order to identify the status of the set. Now, the service technician can judge the severity of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer.

The CSM is a read only mode; therefore, modifications in this mode are not possible.

There are 2 pages in the CSM. the second page is accessed by pressing the 'channel down' button on the remote control or keyboard. Press 'channel up' to view the previous page. The second page shows the status of the ATSC module, like channel input, RF channel selected, channel information, type and status.

How to enter CSM

Use one of the following methods:

- Press the 'MUTE' button on the RC-transmitter **simultaneously** with the 'MENU' button on the TV (top control) for (at least) 4 seconds.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

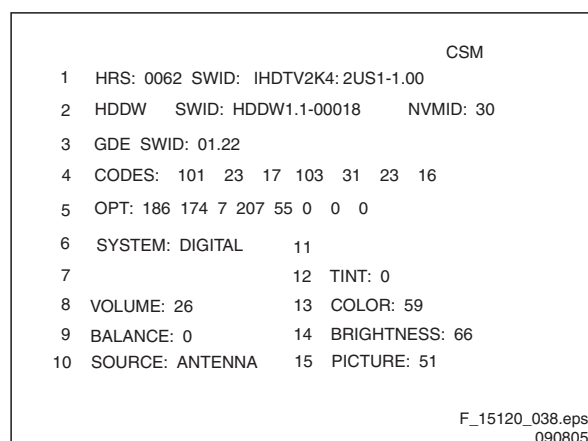


Figure 5-3 CSM menu

Contents of CSM**Customer Service Menu 1**

- **Line 1 :** "HRS : nnnn" and SWID : "2US1-1.00"
 - HRS: Indicates the accumulated total of operational hours. (Shown in hexadecimal format.) (Standby hours are not counted as operating hours).

- SWID: Software identification of the main micro controller (2US1-1.00)
- US1 is 2 letter and 1 digit combination to indicate the software type and the supported languages.
- **Line 2** : "HDDW SWID: HDDW1.1-00018" AND "NVMID: 30";
 - HDDW SWID: Software identification of DW module.
 - NVMID: Software identification of the NVM.
- **Line 3**: "GDE SWID: 01.22"; Software identification of GDE engine.
- **Line 4** : "CODES : xx xx xx xx xx xx xx "; Error code buffer (see explanation of error codes above) Displays the last 7 errors of the error code buffer.
- **Line 5** : "OPT xxx xxx xxx xxx xxx xxx xxx"; Option bytes. Option bits control software and hardware functionality. An option byte or option number represents 8 of those bits. Each option number is displayed as a number between 0 and 255. The set may not work correctly when an incorrect option code is set. See Service Adjustments for more information on correct option settings
- **Line 6**: "SYSTEM : AUTO"; Indicates which Colour and sound system is installed for this preset: NTSC/PAL/SECAM. Complaints that may be caused by an incorrect system setting: no color / colours not correct / unstable picture /noise in picture. To change the system setting of a preset: Press the "MENU" button on the remote control
 - Select the INSTALL sub menu
 - Select the MANUAL STORE sub menu
 - Select and change the SYSTEM setting until picture and sound are correct
 - Select the STORE menu item
- **Line 7** : Line 7 through 15 show the status of customer controls and signal source selected.
- **Line 8**: "VOLUME"; Value indicates level at CSM entry.
- **Line 9** : "BALANCE"; Value indicates level at CSM entry.
- **Line 10** : "SOURCE :"; Indicates which SOURCE is installed for this preset. AV1, AV2, SVHS2, Channel number (8)
- **Line 11**: Line 7 through 15 show the status of customer controls and signal source selected..
- **Line 12** : "TINT"; Value indicates level at CSM entry.
- **Line 13** : "COLOUR"; Value indicates level at CSM entry.
- **Line 14** : "BRIGHTNESS"; Value indicates level at CSM entry.
- **Line 15** : "PICTURE"; Value indicates level at CSM entry.

How to exit CSM

Use one of the following methods:

- Press a key on the remote control transmitter with exception of the 'CHANNEL', 'VOLUME' and digit (0-9) keys)
- Press the 'POWER' button on the remote control transmitter or on the TV set.

5.3 Problems and Solving Tips (related to CSM)

Note: Below described problems are all related to the TV settings. The procedures to change the value (or status) of the different settings are described above. New value(s) are automatically stored.

5.3.1 Picture Problems

Snowy/noisy picture

1. Check line 24 'Noise Figure'. In case the value is 127 or higher, and the value is high on other programs, check the aerial cable/aerial system.
2. Check lines 11 'Sharpness' and 24 'Noise Figure'. In case the value of line 11 is 3 or 4 and the value of line 24 is high (127 or higher), decrease the 'Sharpness' value.

Picture too dark

1. Press 'Smart Picture' button on the RC-transmitter. In case the picture improves, increase the 'Brightness' or the

'Contrast' value. The new value(s) are automatically stored (in 'personal' pre-set) for all TV channels.

2. Check line 7 'Brightness' and 8 'Contrast'. If the value of line 7 is low (< 10) or the value of line 8 is low (< 10), increase the 'Brightness' or the 'Contrast' value.

Picture too bright

1. Press 'Smart Picture' button on the RC-transmitter. In case the picture improves, decrease the 'Brightness' or the 'Contrast' value. The new value(s) are automatically stored (in 'personal' pre-set) for all TV channels.
2. Check lines 7 'Brightness' and 6 'Contrast'. If the value of line 7 is high (> 40) or the value of line 8 is high (> 50). Decrease the 'Brightness' value or increase the 'Contrast' value.

White line around picture elements and text

1. Press 'Smart Picture' button on the Remote Control. In case the picture improves, decrease the 'Sharpness' value. The new value is automatically stored (in "personal" pre-set) for all TV channels.
2. Check line 11 'Sharpness'. Decrease the 'Sharpness' value. The new value is automatically stored for all TV channels.

No picture

Check line 27 'Tuned bit'. In case the value is 'On', install the required program again. Open the installation menu and perform manual installation.

Blue picture

No proper signal is received. Check the aerial cable/aerial system.

Blue picture and/or unstable picture

A scrambled or decoded signal is received.

Black and white picture

Check line 9 'Colour'. In case the value is low (< 10), increase the 'Colour' value. The new value is automatically stored for all TV channels.

No colours/colour lines around picture elements or colours not correct or unstable picture

Check line 20 'TV System'. If a "strange" system pops up, something has gone wrong during installation. Re-install the channel.

Menu text not sharp enough

1. Press 'Smart Picture' button on the RC-transmitter. In case picture improves, decrease the contrast value. The new value(s) are automatically stored for all TV channels.
2. Check line 8 'Contrast'. The value of line 8 is high (> 50). Decrease the contrast value.

5.3.2 Sound Problems

No sound from left and right speaker

Check line 6 'Volume'. The value is low. Increase the value of 'Volume'. The new value(s) are automatically stored (in "personal" pre-set) for all TV channels.

Sound too loud for left and right speaker

Check line 6 'Volume'. The value is high. Decrease the value of 'LS Volume'. The new value(s) are automatically stored (in "personal" pre-set) for all TV channels.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (service remote control), which allows faster and more accurate diagnostics. ComPair has three big advantages:

- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I²C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I²C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the Force/SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial (or RS232) cable.

For this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector(s).

The ComPair fault finding program is able to determine the problem of the defective television. ComPair can gather diagnostic information in two ways:

- Automatic (by communication with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I²C/UART level. ComPair can access the I²C/UART bus of the television. ComPair can send and receive I²C/UART commands to the micro controller of the television. In this way, it is possible for ComPair to communicate (read and write) to devices on the I²C/UART busses of the TV-set.
- Manually (by asking questions to you): Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extent. When this is not the case, ComPair will guide you through the fault finding tree by asking you questions (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point 17 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the fault finding process.

By a combination of automatic diagnostics and an interactive question / answer procedure, ComPair will enable you to find most problems in a fast and effective way.

Beside fault finding, ComPair provides some **additional features** like:

- Up- or downloading of pre-sets.
- Managing of pre-set lists.
- Emulation of the (European) Dealer Service Tool (DST).
- If both ComPair and Force/SearchMan (Electronic Service Manual) are installed, all the schematics and the PWBs of the set are available by clicking on the appropriate hyperlink.

Example: *Measure the DC-voltage on capacitor C2568 (Schematic/Panel) at the Mono-carrier.*

- Click on the "Panel" hyperlink to automatically show the PWB with a highlighted capacitor C2568.

- Click on the "Schematic" hyperlink to automatically show the position of the highlighted capacitor.

5.4.3 How To Connect

This is described in the chassis fault finding database in ComPair .

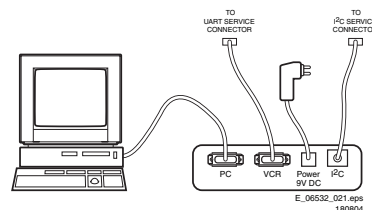


Figure 5-4 ComPair interface connection

5.4.4 How To Order

ComPair order codes (US):

- ComPair Software: ST4191.
- ComPair Interface Box: 4822 727 21631.
- AC Adapter: T405-ND.
- ComPair Quick Start Guide: ST4190.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630.

Note: If you encounter any problems, contact your local support desk.

5.5 Error Codes

5.5.1 Introduction

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, the error code will appear at the left side and all other errors shift one position to the right.

5.5.2 How to read the error buffer

Use one of the following methods:

- On screen via the SAM (only possible when you have a picture). Examples:
 - ERR: 0 0 0 0 0 0** : No errors detected.
 - ERR: 6 0 0 0 0 0** : Error code 6 is the last and only detected error.
 - ERR: 9 6 0 0 0 0** : Error code 6 was first detected and error code 9 is the last detected (newest) error.
- Via the "blinking LED" procedure, if no picture is available. See explanation of "The blinking LED procedure" below.

5.5.3 How to clear the error buffer

The error code buffer will be cleared in the following cases:

- By activating "CLEAR ERRORS" in the SAM menu.
- By exiting SDM or SAM with the "Standby" command on the remote control.
- Upon automatic reset, when the content has not changed for 50 consecutive hours.

Note: By leaving SDM or SAM via the Mains switch, the error buffer will not be reset.

5.5.4 Error codes

In case of non-intermittent faults, clear the error buffer before starting the repair. This to ensure that "old" error codes are no longer present. Before clearing the buffer, write down the content, as the history can give you valuable information. If possible, check the entire content of the error buffer. In some situations, an error code is only the result of another error code, and not the actual cause (e.g. a fault in the protection detection circuitry can also lead to a protection).

Table 5-1 Error Code Table

Error number	Explanation
0	No error
1	FBX 3V3 protection
2	No Horizontal Flyback protection
3	Vertical Output Failure (GDE)
4	+5V protection active
5	HOP POR not successful
6	General I2C error main I2C bus
7	DAC Initialisation failure (GDE)
8	(not applicable)
9	HCS-GDE communication failure
10	NVM communication failure
11	NVM Id error
12	Main uP Internal RAM test failure
13	Main tuner I2C failure
14	Sound I2C failure
15	SRAM test failure
16	(not applicable)
17	(not applicable)
18	(not applicable)
19	(not applicable)
20	(not applicable)
21	(not applicable)
22	(not applicable)
23	Bocma IC TDA888xx on DW panel error
24	
25	
26	
27	Virtual Dolby error
30	HIP I/O-video processing error
31	Feature Box error
32	
33	
34	
35	
100	
101	No Ack or response from GDE
102	HCS encountered errors
103	Sony A/V Switch I2C communication failure
104	GDE non-critical error
105	Change Display Config Exit did not occur
106	I'm alive' not received in time
107	Reserved for future error codes
108	Reserved for future error codes
109	Reserved for future error codes
110	Reserved for future error codes
111	Reserved for future error codes
112	Reserved for future error codes
113	Reserved for future error codes
114	Reserved for future error codes
115	Reserved for future error codes
116	Reserved for future error codes
117	Reserved for future error codes
118	Reserved for future error codes
119	Reserved for future error codes

Note: Error codes 1, 2, 3, and 4 are protection codes, and in this case, the supplies of some circuits will be switched "off". Also, in protection, the LED will blink the number of times equivalent to the most recent error code.

Table 5-2 Error Code Table GDE

Error	Error Name	Description
A	Vertical Output Failure	This error indicates the Vertical Deflection pulse received at pin 9 on the TDA933x is not correct. This can be caused by a failure in the HOP board or the Scan Board.
B	Horizontal Flyback Failure	This error indicates the Horizontal Flyback pulse received at pin 13 on the TDA933x is not correct. This can be caused by a failure in the HOP board or the Scan Board.
C	HOP Initialization Failure	This error indicates the TDA933x was not initialized correctly during ACS board power up. This can be caused by an error on the ACS board, the HOP board or the Small Signal Carrier board.
D	DAC Initialization Failure	This error indicates the TDA8444 was not initialized correctly during ACS board power up. This can be caused by an error on the ACS board, the HOP board or the Small Signal Carrier board.
E	Auto Convergence Failure	This error indicates an error during the Auto Convergence process.
F	Set References Failure	This error indicates there was an error while setting the reference values.
G	Sensor Pattern Failure	This error indicates there is an error in a sensor or an error occurred while walking a pattern across a sensor.
H	General Initialization Failure	This error indicates a general initialization software failure. This error is caused by the ACS board.
I	HOP IIC Error	This error indicates there was an IIC error while accessing the HOP. This can be caused by an error on the ACS board, the HOP board or the Small Signal Carrier.
J	DAC IIC Error	This error indicates there was an IIC error while accessing the DAC. This can be caused by an error on the ACS board, the HOP board or the Small Signal Carrier.
K	ST2050A IIC Error	This error indicates there was an IIC error while accessing the ST2050A. This can be caused by an error on the ACS board.
L	Main EEPROM IIC Error	This error indicates there was an IIC error while accessing the main EEPROM on the ACS board. This can be caused by an error on the ACS board.
M	EEPROM Factory Service 1 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM factory/service area 1. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
N	EEPROM Factory Service 2 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM factory/service area 2. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
O	EEPROM Factory Service 3 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM factory/service area 3. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
P	EEPROM Customer Data 1 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM customer data area 1. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
Q	EEPROM Customer Data 2 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM customer data area 2. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
R	EEPROM Customer Data 3 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM customer data area 3. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
S	EEPROM Factory Service 4 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM factory/service area 4. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
T	EEPROM Factory Service 5 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM factory/service area 5. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
U	EEPROM Factory Service 6 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM factory/service area 6. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
V	EEPROM Customer Data 4 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM customer data area 4. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
W	EEPROM Customer Data 5 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM customer data area 5. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
X	EEPROM Customer Data 6 Failure	This error indicates there was a data integrity failure when accessing the main EEPROM customer data area 6. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.
Y	EEPROM Scratch Pad Failure	This error indicates there was a data integrity failure when accessing the main EEPROM scratch pad area. This error is caused by corrupted EEPROM data that does not match the data integrity CRC.

5.6 The "Blinking LED" Procedure

5.6.1 Introduction

The contents of the error buffer can also be made visible through the "blinking LED" procedure. This is especially useful when there is no picture.

When the SDM is entered, the LED will blink the number of times equal to the value of the error code.

- The ON/OFF indicator going out for 500 ms precedes all error code sequences. (There is a possibility of up to 10.)
- After the 500 ms delay, the ON/OFF indicator will slowly flash the first number of the first code.
- This immediately follows by rapid flashes for the second number in the first code. If an error code is smaller than 10, the ON/OFF indicator will rapidly flash 1-9 times to indicate the code. (EXP. Six rapid flashes indicate an error code of 6.)
- There will be a delay of approximately 3 seconds between codes.
- For error codes of 10 and higher, the ON/OFF indicator will slowly flash the correct number of times to indicate the first digit, and will then rapidly flash the correct number of times to indicate the second digit. (EXP. Three slow flashes followed by six rapid flashes indicate an error code of 36.)
- When all error-codes are displayed, the sequence is finished and the ON/OFF indicator turns OFF for 300 ms. At this point the sequence will begin again as indicated by the ON/OFF indicator turning ON for 300 ms and repeating all error codes.

Example: 112 024 036 0 0

After entering SDM:

- The sequence will begin by the ON/OFF indicator turning off for 500 ms.
- Then slowly blink 11 times followed by two rapid blinks (indicating error code 112).
- Next the LED will pause for 300 ms followed by 2 slow blinks follow by 4 rapid blinks, (indicating error code 024).
- Next the LED will pause for 300 ms, then slowly blink 3 times followed by 6 rapid blinks (indicating error code 36).
- Then pause 300 ms ending the sequence in this example.
- If there were error codes in positions 4 and 5, those sequences would also be given.

Note: If errors 1, 2, 3, or 4 occur, the LED **always** blinks indicating the last error that occurred, even if the set is **not** in service mode.

5.7 Trouble Shooting Tips

5.7.1 Introduction

Before the set can be repaired to a component level, it is necessary to determine which board is defective. The Wiring interconnect diagram is a useful tool for this (see chapter 6).

5.7.2 Dead set

The Standby Power supply and Rectifiers are located on the Input panel. Control for power On/Off is performed by the Microprocessor located on the SSB. This Processor is powered by the 5 Volt standby voltage from the Input Panel. For a Dead Set condition, check the 5 Volt standby supply on Pin 1 of 1102. If this voltage is present, check the Standby line on Pin 3. This line will be approximately 2.6 Volts in standby and zero Volts when the set is turned "on". If the Standby line goes Low, check the 130 Volt source on Pin 8 of connector 1518. If this voltage is present, the Full Power supply on located on the Large Signal panel is working. If the Picture is not present but audio is, the High voltage or video drive circuits may have failed.

Checking the Screen voltage from the Focus G2 block will indicate whether the High voltage circuit is working or not. Horizontal and Vertical drive from the HOP panel must be present for the High voltage to be present. Horizontal drive should be present on Pin 9 of 1510 and Vertical drive should be present on Pin 3.

5.7.3 No Picture

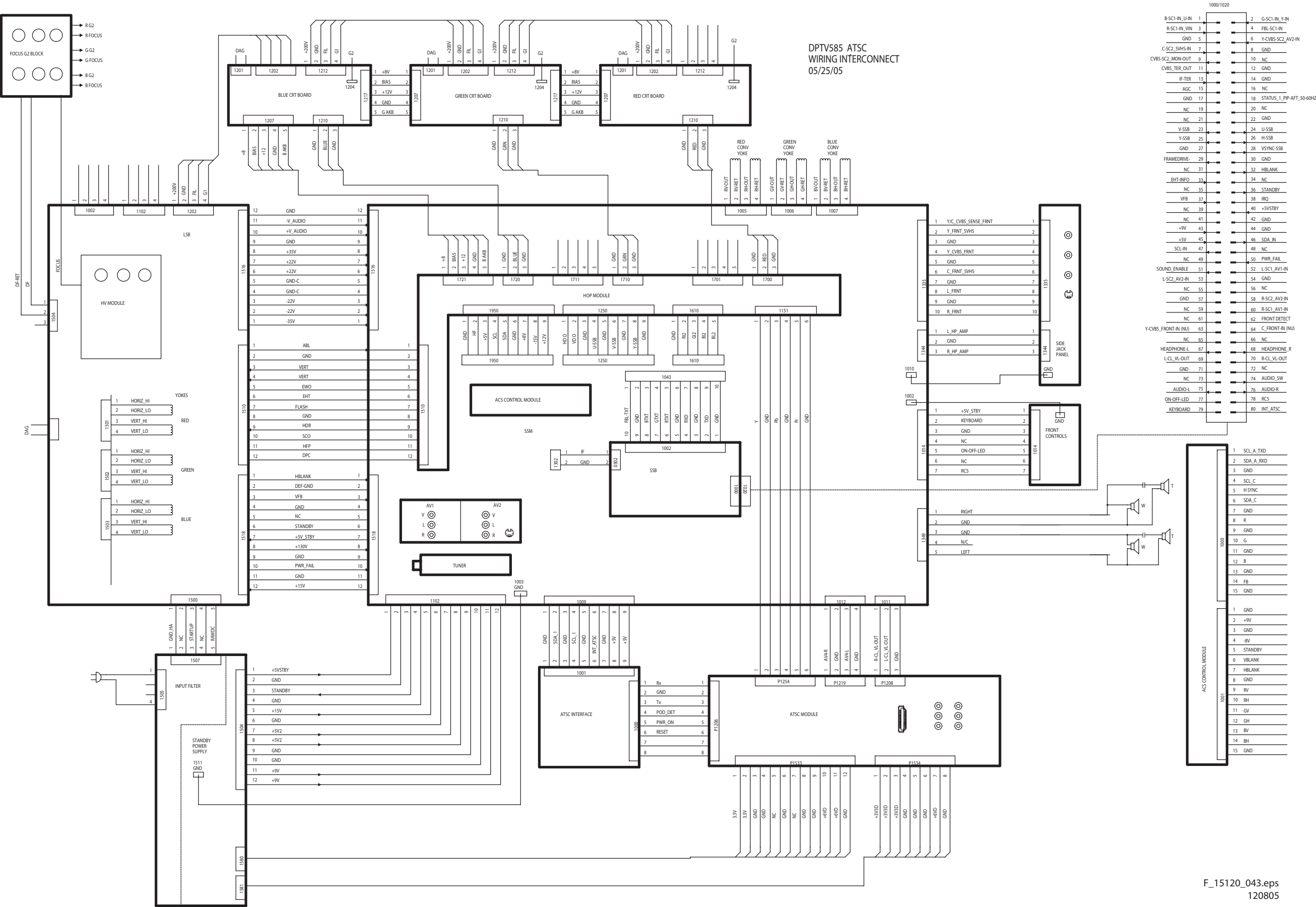
If Audio is present but there is no Picture, press the Index button on the Remote control. If OSD is present, High voltage is working and the CRT drive circuits are working. If the signal is NTSC, YUV from the SSM is fed to the HOP on connector 1250. YUV from the SSB can be checked on Pins 25, 24, and 23 of connector 1020.

5.7.4 No Audio

The Audio amplifier is located on the SSM. The Audio is powered by a supply located on the Large Signal panel. This voltage can be checked on Pins 10 and 11 of connector 1516. These voltages will measure a plus 23 and a minus 23 Volts. Speaker output can be checked on connector 1349. A Centre Channel Amp switch panel will be present on the Core models

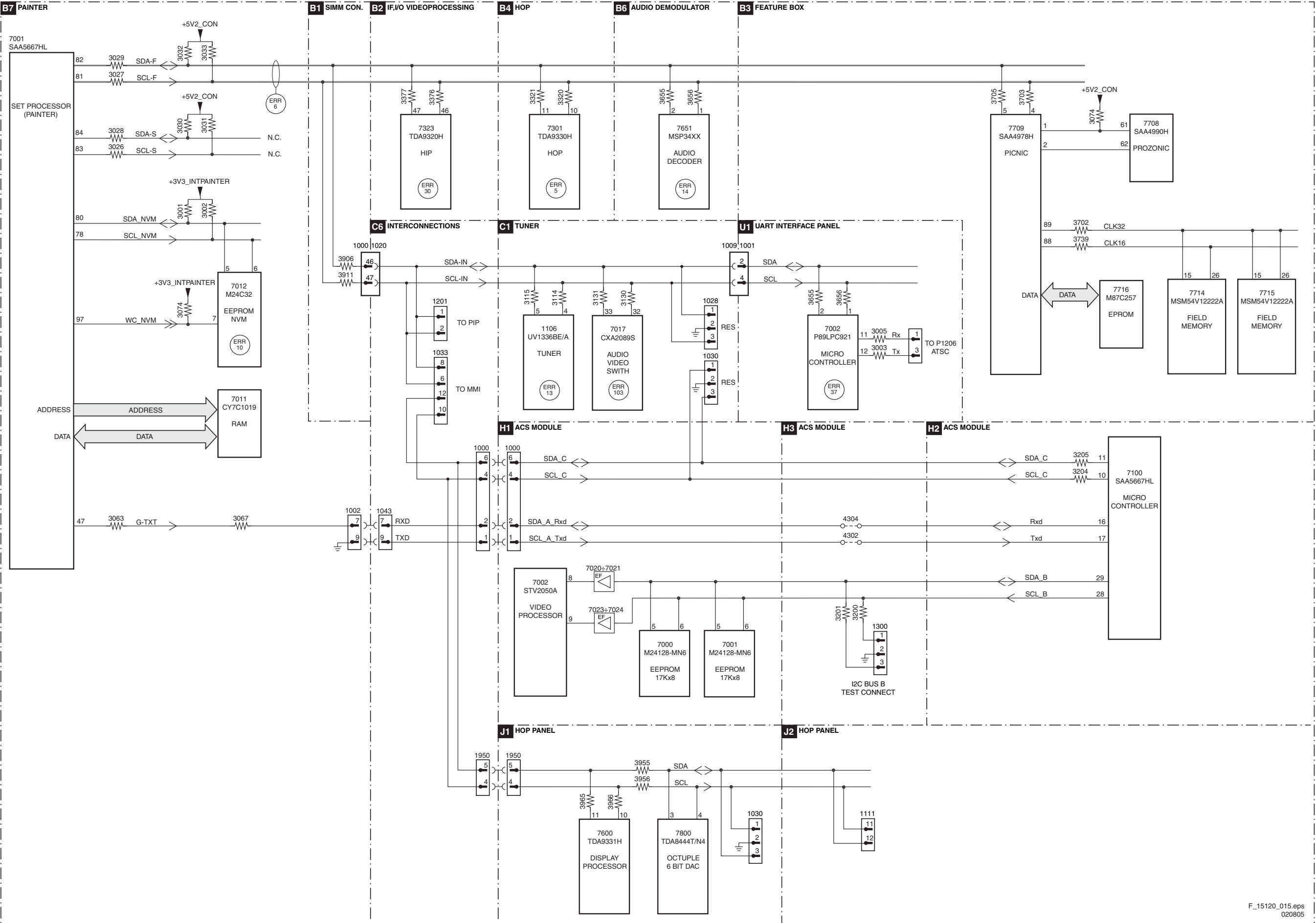
6. Block Diagrams, Testpoint Overviews, and Waveforms

Wiring Diagram

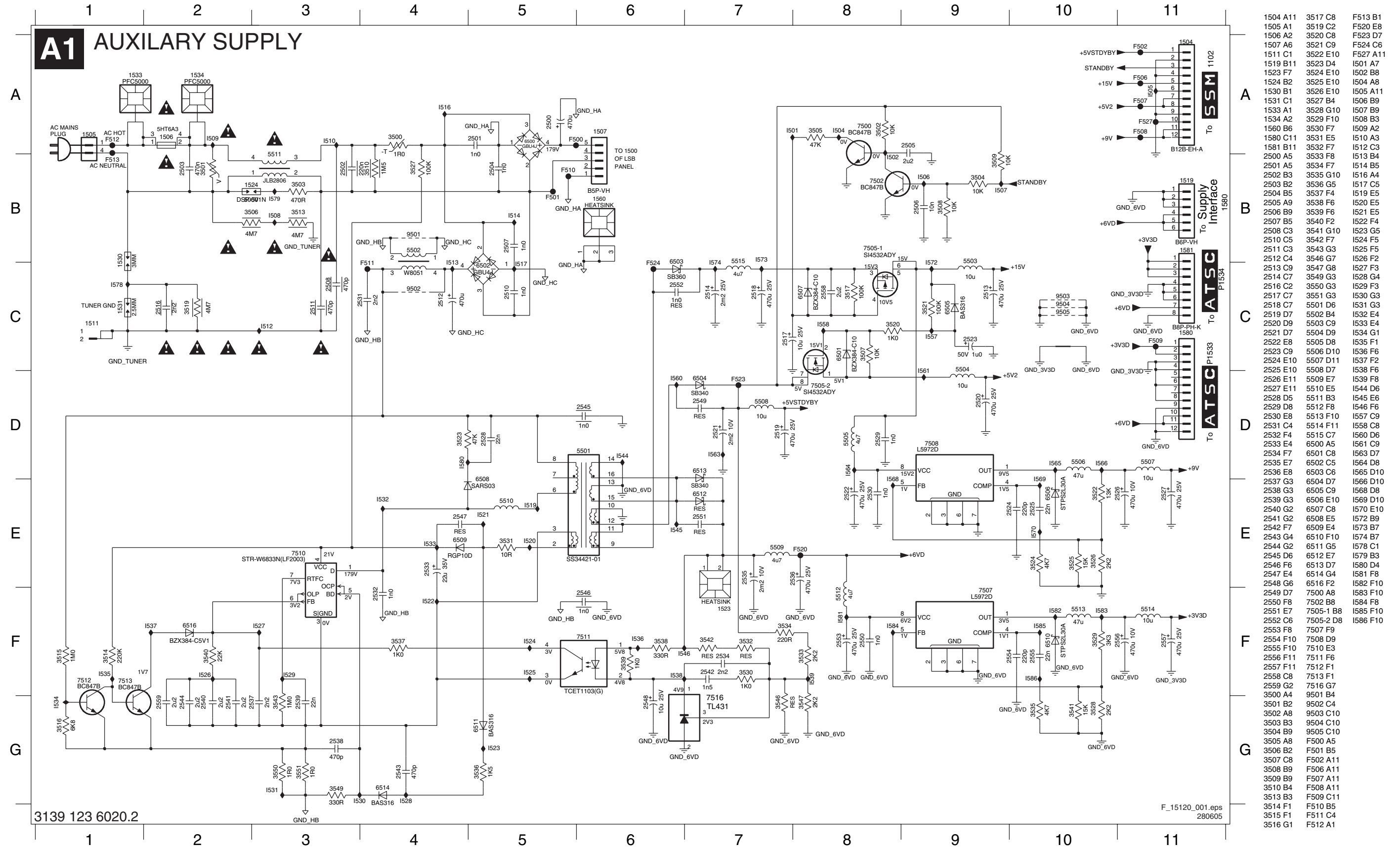


I2C Overview

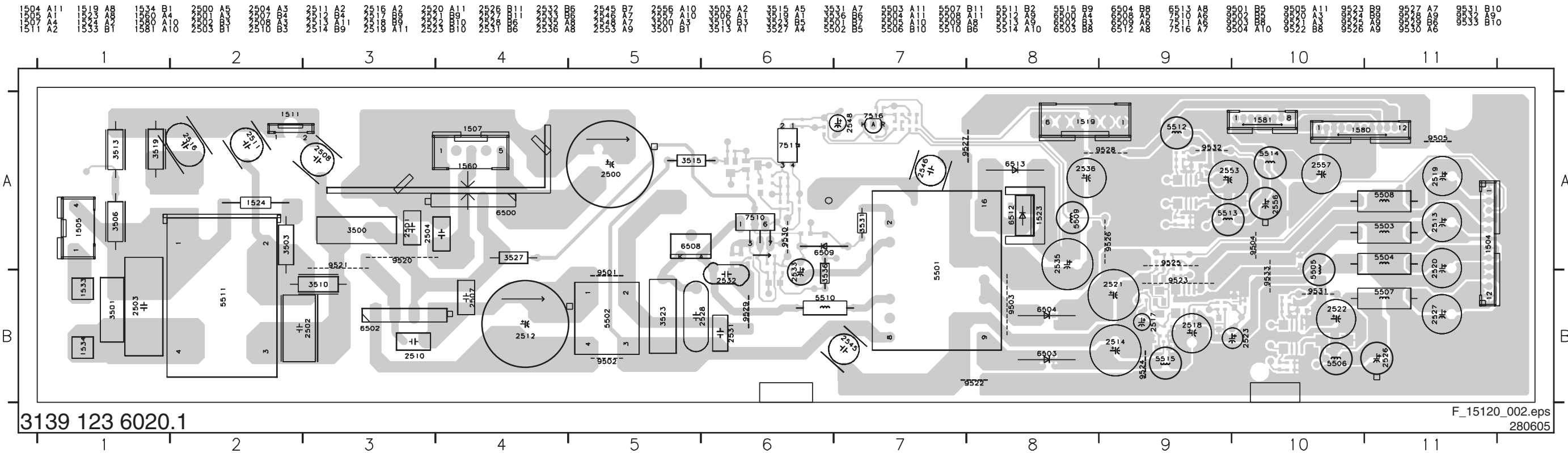
I2C



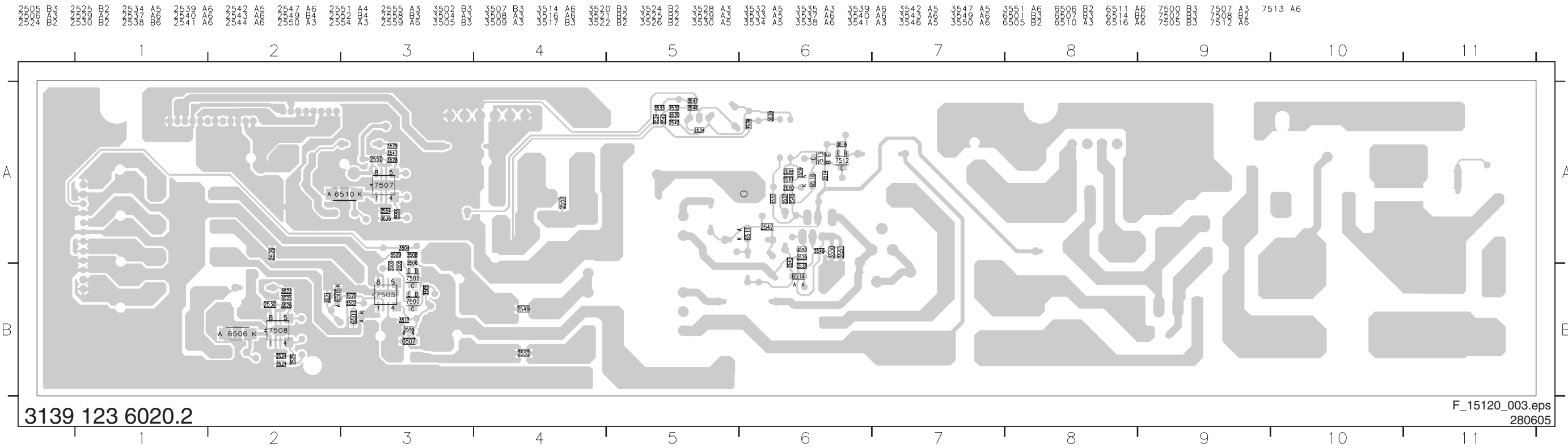
Power Supply Panel: AC Input



Layout Power Supply Panel (Top Side)

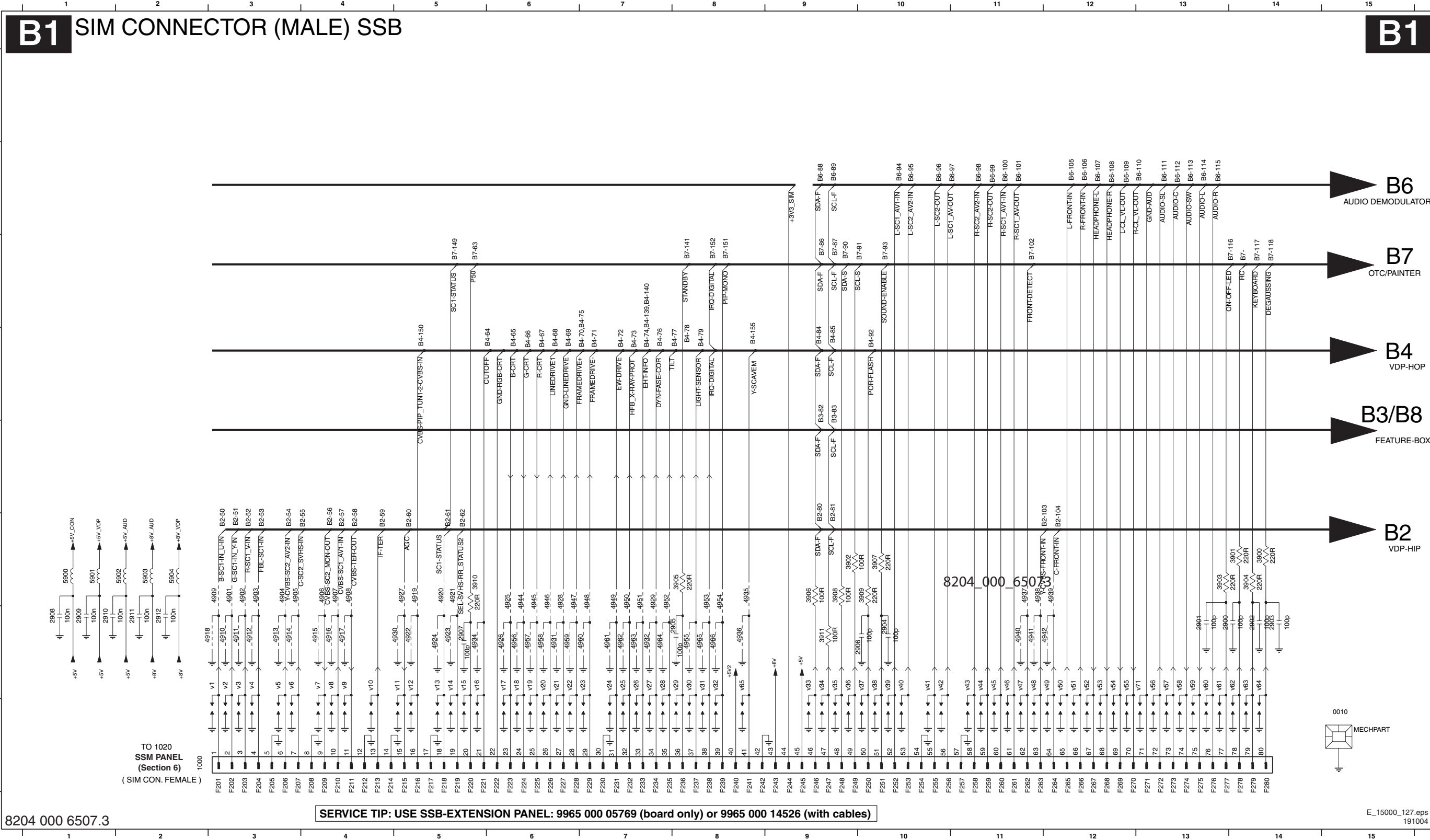


Layout Power Supply Panel (Bottom Side)

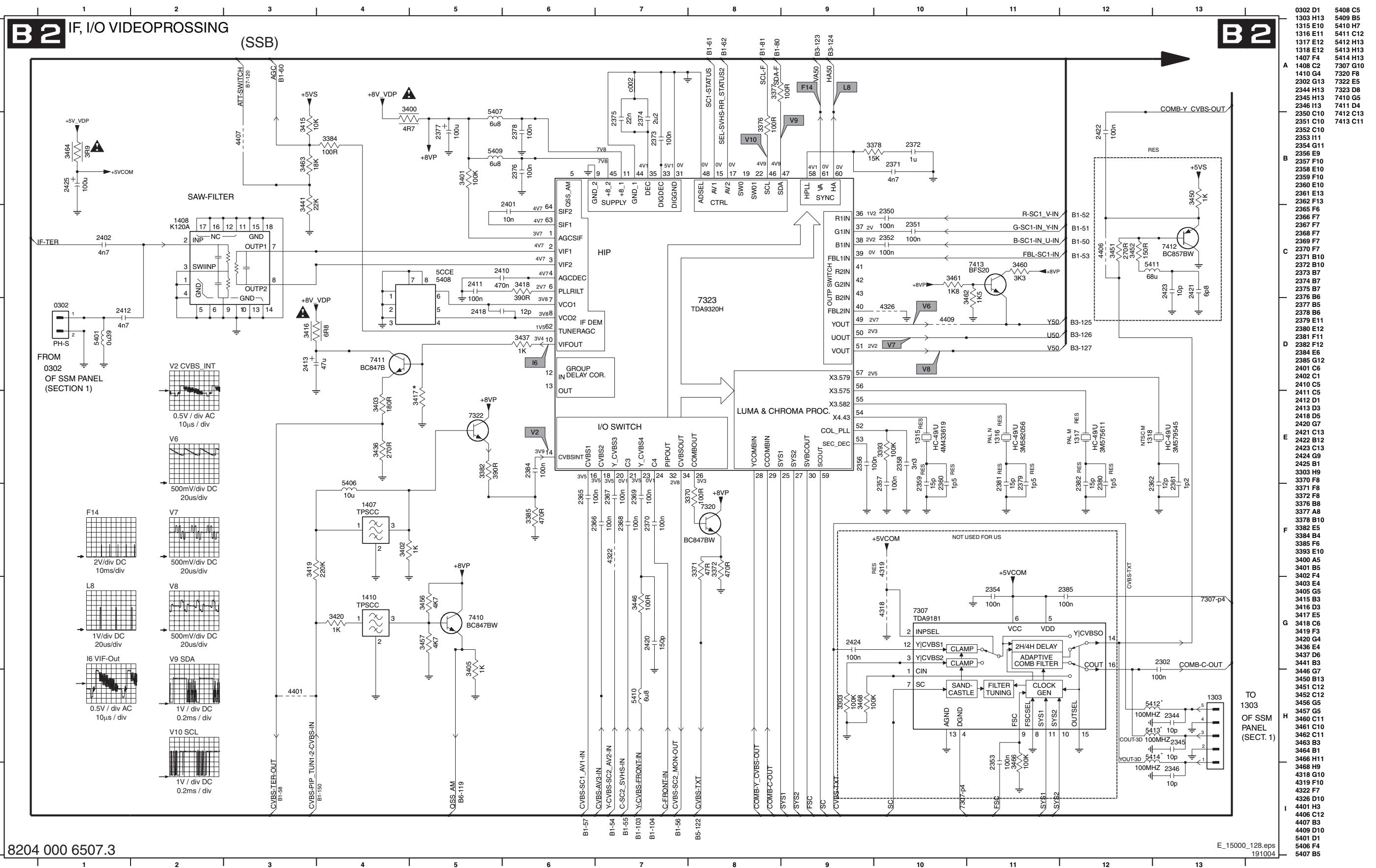


SSB: SIM Connector (Male)

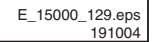
v1 G3	v6 G3	v11 G5	v16 G5	v21 G6	v26 G7	v31 G8	v38 G10	v43 G11	v48 G11	v53 G12	v58 G13	v63 G14	1000 H2	2904 G10	2909 G1	3901 F14	3906 F14	3911 G14	4905 F3	4910 G3	4915 G4	4920 F5	4925 F6	4930 G5	4936 G8	4941 G11	4947 F6	4952 F7	4957 G6	4962 G7	5900 F1
v2 G3	v7 G4	v12 G5	v17 G6	v22 G6	v27 G7	v32 G8	v39 G10	v44 G11	v49 G12	v54 G12	v59 G13	v64 G14	2900 G13	2905 G8	2910 G1	3902 F9	3907 F10	4901 F3	4906 F4	4911 G3	4916 G4	4921 F5	4926 G6	4931 G6	4937 F11	4942 G12	4948 F7	4953 F8	4958 G6	4963 G7	5901 F1
v3 G3	v8 G4	v13 G5	v18 G6	v23 G7	v28 G7	v35 G9	v40 G10	v45 G11	v50 G12	v55 G12	v60 G13	v65 G8	2901 G13	2906 G10	2911 G2	3903 F13	3908 F9	4902 F3	4907 F4	4912 G3	4917 G4	4922 G5	4927 F5	4932 G7	4938 F11	4944 F6	4949 F7	4954 F8	4959 G6	4964 G7	5902 F2
v4 G3	v9 G4	v14 G5	v19 G6	v24 G7	v29 G8	v36 G9	v41 G10	v46 G11	v51 G12	v56 G13	v61 G13	v71 G12	2902 G14	2907 G5	2912 G2	3904 F14	3909 F10	4903 F3	4908 F4	4913 G3	4918 G3	4923 G5	4928 F6	4934 G5	4939 F12	4945 F6	4950 F7	4955 G8	4960 G7	4965 G8	5903 F2
v5 G3	v10 G4	v15 G5	v20 G6	v25 G7	v30 G8	v37 G10	v42 G10	v47 G11	v52 G12	v57 G13	v62 G14	0010 H15	2903 G14	2908 G1	3900 F14	3905 F8	3910 F5	4904 F3	4909 F3	4914 G3	4919 F5	4924 G5	4929 F7	4935 F8	4940 G11	4946 F6	4951 F7	4956 G6	4961 G7	4966 G8	5904 F2



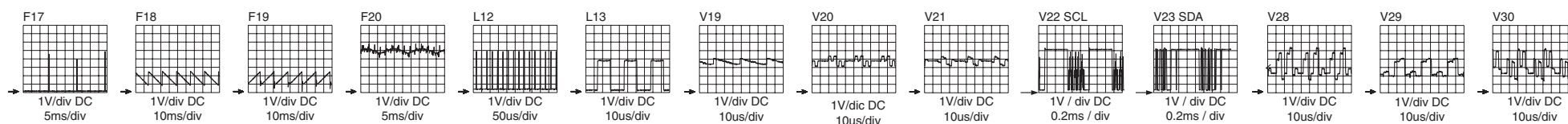
SSB: IF, I/O Videoprocessing



B3

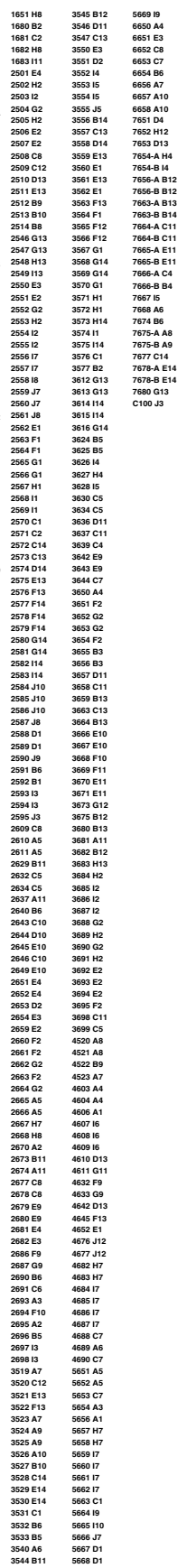


B 4 HOP



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	1304 H3	3342 C9	7304 G2
	2300 I11	3343 D12	7305 B8
	2301 B2	3344 D10	7306 A9
	2303 E8	3345 D8	7308 H6
	2304 G7	3346 C8	7309 G10
	2306 H9	3347 D8	7310 F12
	2307 F3	3348 D9	7311 G11
	2308 G8	3350 B10	7312 D10
B	2309 D3	3351 B9	7313 A11
	2310 E3	3352 A9	7314 A10
	2311 H5	3353 A11	7315 B11
	2313 F8	3354 A11	7317 E10
	2314 E1	3355 A7	7318 D9
	2315 E2	3358 A12	7324 G6
	2317 E3	3359 B9	7340 B12
	2318 E3	3360 A7	7375 A8
	2319 G10	3362 G10	C001 H12
	2320 H3	3363 F2	
C	2321 B3	3364 G11	
	2322 B3	3365 G11	
	2323 B3	3366 F9	
	2324 H6	3367 F9	
	2325 G5	3368 F12	
	2328 B7	3369 F12	
	2329 B6	3373 A8	
	2330 A6	3374 A8	
	2331 B6	3375 E12	
	2332 E2	3386 G12	
D	2333 D10	3387 G1	
	2334 E8	3388 F11	
	2335 H6	3389 D10	
	2336 E8	3390 D9	
	2338 G11	3391 G12	
	2339 E11	3392 E10	
	2340 I12	3394 D8	
	2341 E1	3395 C3	
	2342 A7	3396 D2	
	2343 A9	3397 D2	
E	2347 I2	3398 D2	
	2348 I2	3399 B12	
	2349 I2	3453 C2	
	2363 F3	3454 B1	
	2395 D3	3455 C1	
	2396 D2	3458 F2	
	2397 D3	3459 B12	
	2398 I10	3465 B9	
	2399 A2	3467 B8	
	2426 H2	3469 D11	
F	2427 H2	3470 E11	
	2428 I2	3472 E10	
	2429 A4	4302 A3	
	3300 H11	4303 A3	
	3301 A9	4304 A3	
	3302 C3	4305 A4	
	3304 H12	4307 B9	
	3305 C2	4308 B4	
	3306 E8	4309 B4	
	3307 E9	4310 B4	
G	3308 E9	4311 I9	
	3309 E11	4312 I9	
	3310 E8	4313 G13	
	3311 G7	4369 F13	
	3312 F12	5301 E2	
	3313 A7	5302 E2	
	3314 G7	5303 H10	
	3315 G8	5304 H2	
	3316 H9	5305 H2	
	3317 G9	5306 I2	
H	3318 F8	5307 I2	
	3319 A7	5308 I2	
	3320 D2	5309 I2	
	3321 D2	6303 H8	
	3322 D12	6304 H9	
	3323 H5	6306 I5	
	3324 I4	6307 I5	
	3325 G5	6308 C2	
	3326 G5	6309 D11	
	3327 G5	6310 D10	
I	3328 F8	6311 D12	
	3329 E1	6312 G7	
	3330 G9	6313 H8	
	3331 G3	6314 H9	
	3332 B7	6315 I6	
	3333 G3	6316 I6	
	3334 H4	6317 E12	
	3335 G6	6318 E11	
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	3337 H5	6321 C8	
	3338 H6	6334 H4	
	3339 C3	7301 B3	

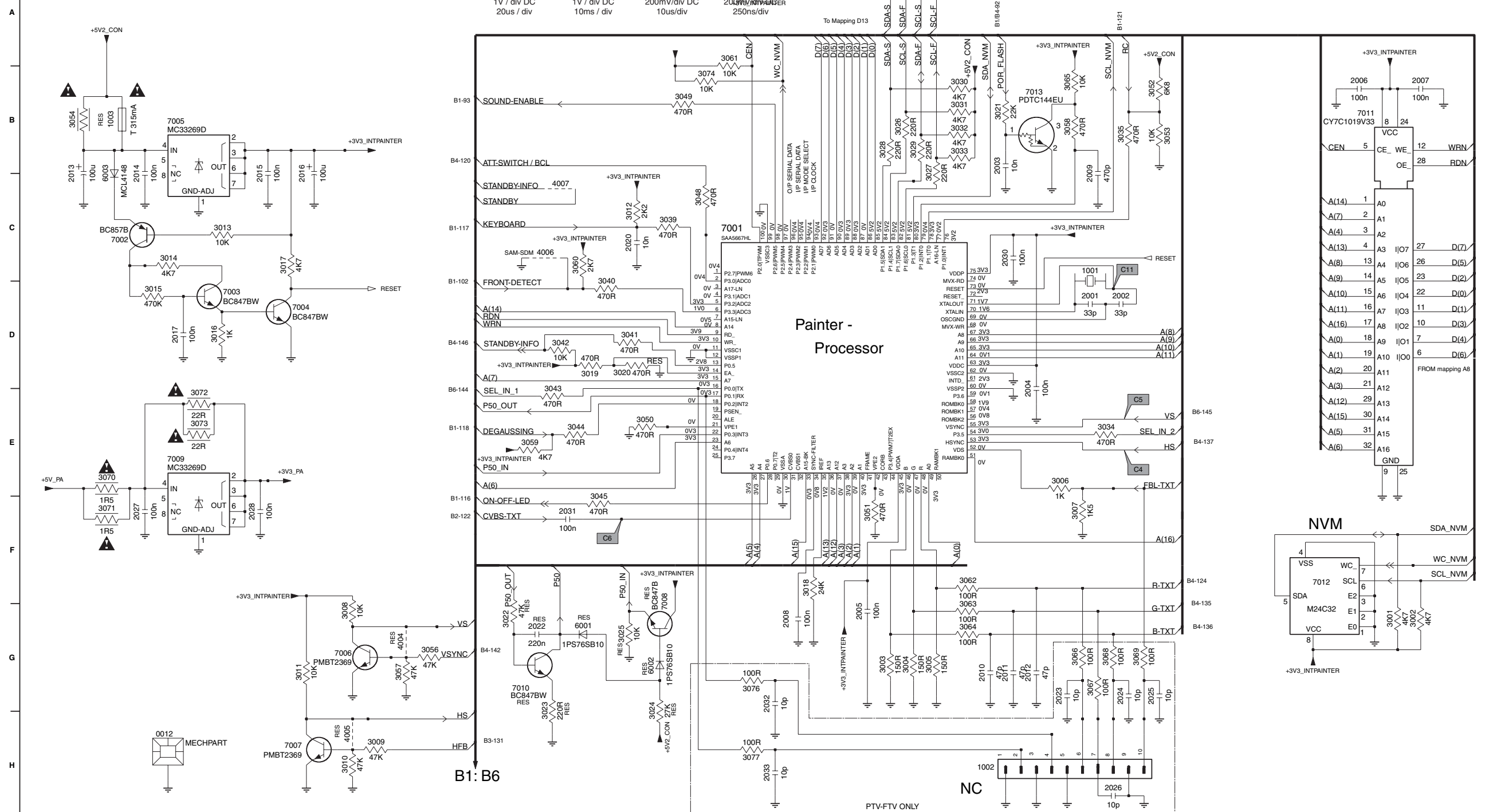
B6 AUDIO DEMODULATOR



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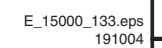
B 7 PAINTER



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	2002 D10	3061 A7
	2003 B9	3062 F9
	2004 D10	3063 G9
	2005 G8	3064 G9
	2006 B13	3065 B10
B	2007 B13	3066 G10
	2008 G7	3067 G10
	2009 B10	3068 G10
	2010 G9	3069 G11
	2011 G9	3070 E1
	2012 G10	3071 F1
	2013 B1	3072 E2
	2014 B1	3073 E2
	2015 B2	3074 B7
	2016 B3	3076 G7
C	2017 D2	3077 H7
	2020 C6	4002 A8
	2022 G5	4003 A8
	2023 G10	4004 G4
	2024 G10	4005 H3
	2025 G11	4006 C5
	2026 H10	4007 C5
	2027 F1	6001 G5
	2028 F2	6002 G6
	2030 C9	6003 B1
D	2031 F5	7001 C7
	2032 G7	7002 C1
	2033 H7	7003 D2
	3001 G13	7004 D3
	3002 G13	7005 B2
	3003 G8	7006 G3
	3004 G8	7007 H3
	3005 G9	7008 G6
	3006 E10	7009 E2
	3007 F10	7010 G5
E	3008 G3	7011 B13
	3009 H3	7012 F12
	3010 H3	7013 B9
	3011 G3	
	3012 C6	
	3013 C2	
	3014 C2	
	3015 D1	
	3016 D2	
	3017 C3	
F	3018 F7	
	3019 D5	
	3020 D6	
	3021 B9	
	3022 G5	
	3023 G5	
	3024 G6	
	3025 G6	
	3026 B8	
	3027 B9	
G	3028 B8	
	3029 B8	
	3030 B9	
	3031 B9	
	3032 B9	
	3033 B9	
	3034 E10	
	3035 B10	
	3039 C6	
	3040 D6	
H	3041 D6	
	3042 D5	
	3043 E5	
	3044 E5	
	3045 F6	
	3048 C6	
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	3050 E6	
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3054 B1		

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Mapping Layout SSB (Top Side)

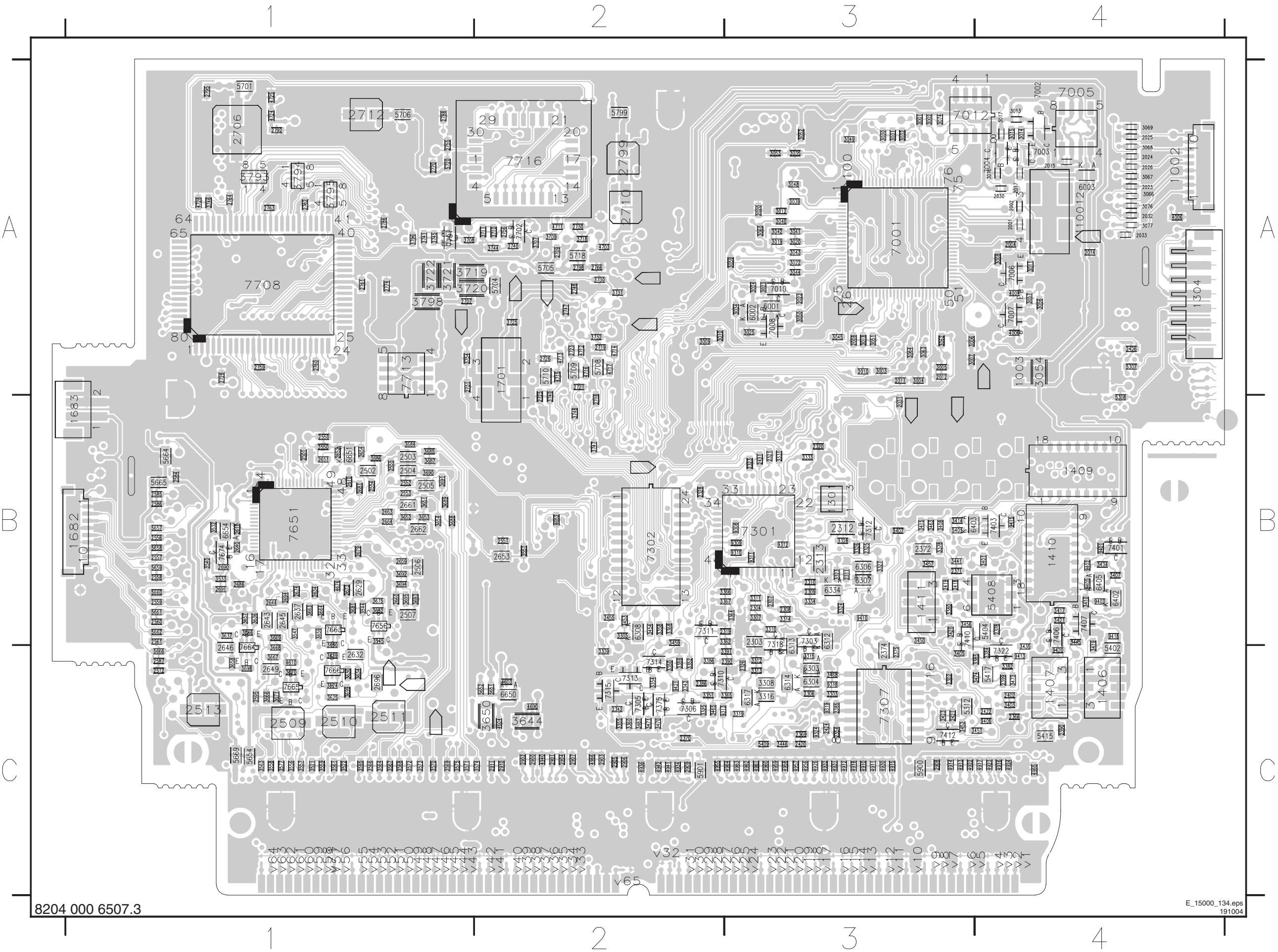
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1403	C1	2508	B3	3320	B2	3627	B4	4938	C3	9304	B3
1408	B1	2514	C4	3321	B2	3628	B4	4939	C3	9305	B3
1651	B4	2546	C4	3322	C3	3642	B4	4944	C2	9322	C2
1680	B4	2547	C4	3329	C3	3643	B4	4945	C2	9408	C1
1681	B4	2548	C4	3330	B2	3655	B4	4946	C2	9412	C1
2003	A1	2549	C3	3332	B2	3656	B4	4947	C2	9414	C1
2005	A2	2562	B4	3335	B2	3673	C4	4948	C2	9416	B1
2006	A2	2563	B4	3336	C3	3683	C4	4949	C2	9417	C1
2007	A2	2564	C4	3340	C2	3702	A4	4950	C2	9419	C1
2009	A2	2565	C4	3341	C2	3703	A3	4951	C2		
2013	A1	2566	C4	3342	C2	3704	A4	4952	C2		
2016	A1	2567	C4	3343	C3	3705	A3	4953	C1		
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2305	B2	2571	B4	3347	C3	3717	B3	5303	A1		
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2316	B2	2574	C4	3353	C3	3739	A4	5306	A1		
2317	B2	2575	C4	3361	B3	3755	A3	5309	A1		
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2352	C2	2677	B4	3399	C3	4520	C4	5902	C3		
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2362	B2	2702	A4	3418	B1	4632	B4	6320	A1		
2363	B2	2704	B3	3423	C1	4633	B4	6321	A1		
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2365	C1	2713	A4	3436	C1	4645	B4	6404	B1		
2367	C2	2729	B3	3437	B1	4677	B4	6652	B3		
2368	C2	2733	A3	3439	C1	4682	B3	6653	C3		
2373	C2	2738	A3	3442	C2	4683	B3	6656	C4		
2376	B2	2743	A3	3443	C2	4684	B3	6657	C4		
2377	B2	2757	A4	3444	C2	4685	B3	6658	B4		
2379	B1	2758	A4	3447	C2	4686	B3	7009	A3		
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2382	B1	2771	A3	3460	B2	4689	C4	7304	B2		
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2401	B2	3028	A2	3529	C4	4903	C2	7413	B2		
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2405	B1	3033	A2	3531	B4	4905	C2	7653	B4		
2406	B1	3058	A2	3552	C4	4906	C2	7654	B4		
2407	B1	3061	A2	3553	B4	4907	C1	7667	B4		
2408	B1	3065	A2	3554	B4	4908	C1	7668	C4		
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2417	B1	3302	B3	3613	C4	4927	C2	7709	A4		
2425	C3	3304	B3	3614	C4	4928	C2	7714	A4		
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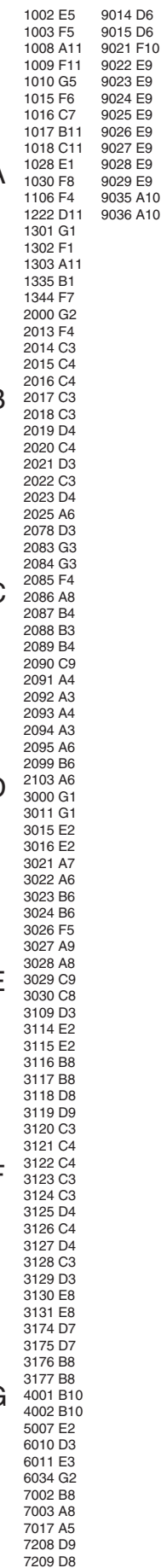
Mapping Layout SSB (Bottom Side)

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1003	A4	2512	C1	2907	C2	3359	C2	3654	B1	4926	C3	7307	C3
1301	B3	2513	C1	2908	C3	3360	C2	3657	B1	4930	C3	7310	C3
1304	A4	2550	B1	2909	C2	3362	B3	3658	C1	4931	C3	7311	C2
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1306	B4	2552	B1	2911	C2	3365	C3	3663	B1	4934	C2	7313	C2
1307	B4	2553	B1	3001	A3	3366	B3	3664	B1	4936	C2	7314	C2
1308	B3	2554	B1	3002	A3	3367	B3	3666	C1	4940	C2	7315	C2
1406	C4	2555	B1	3003	A3	3368	B2	3667	C1	4941	C2	7318	B3
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1411	B3	2559	B1	3007	A3	3385	C4	3671	C1	4957	C3	7403	B4
1682	B1	2560	B1	3008	A4	3386	C2	3675	B1	4958	C3	7406	B4
1683	B1	2561	B1	3009	A2	3391	C3	3680	B1	4959	C3	7407	B4
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2002	A4	2586	B1	3012	A3	3405	C3	3684	B1	4962	C3	7651	B1
2004	A4	2587	C1	3013	A4	3407	B4	3685	B1	4963	C3	7656	B1
2008	A3	2595	C1	3014	A4	3408	B3	3686	B1	4964	C3	7663	B1
2010	A3	2610	B1	3015	A4	3410	B4	3687	B1	4965	C4	7664	C1
2011	A3	2611	B1	3016	A4	3414	B3	3688	B1	4966	C2	7665	C1
2012	A3	2629	B1	3017	A4	3415	B3	3689	B1	5307	A4	7666	C1
2014	A4	2632	C1	3018	A3	3417	B4	3690	B1	5308	B4	7674	B1
2015	A4	2634	B1	3019	A3	3419	C4	3691	B1	5312	C3	7701	A1
2017	A4	2637	B1	3020	A3	3420	B3	3692	B1	5401	B3	7702	A2
2020	A3	2640	B1	3022	A3	3421	B4	3693	B1	5402	C4	7708	A1
2022	A3	2643	B1	3023	A3	3434	B4	3694	B1	5404	B4	7713	A1
2023	A4	2644	B1	3024	A3	3435	C4	3695	B1	5408	B4	7716	A2
2024	A4	2645	B1	3025	A3	3441	B3	3698	C1	5409	C3	9308	B3
2025	A4	2646	C1	3030	A3	3445	B4	3699	C1	5415	C4	9309	B3
2026	A4	2649	C1	3031	A3	3446	C3	3707	A2	5417	C4	9310	B3
2030	A4	2651	B1	3032	A3	3450	B3	3708	A1	5651	C2	9311	B3
2031	B3	2652	B1	3034	A3	3451	C4	3709	A2	5652	C2	9312	B3
2032	A4	2653	B2	3035	A3	3452	C3	3710	A2	5654	C1	9313	C2
2033	A4	2654	B1	3039	A3	3453	B2	3711	A2	5657	B1	9318	C3
2302	C3	2659	B1	3040	A3	3454	B2	3718	A2	5658	B1	9319	C3

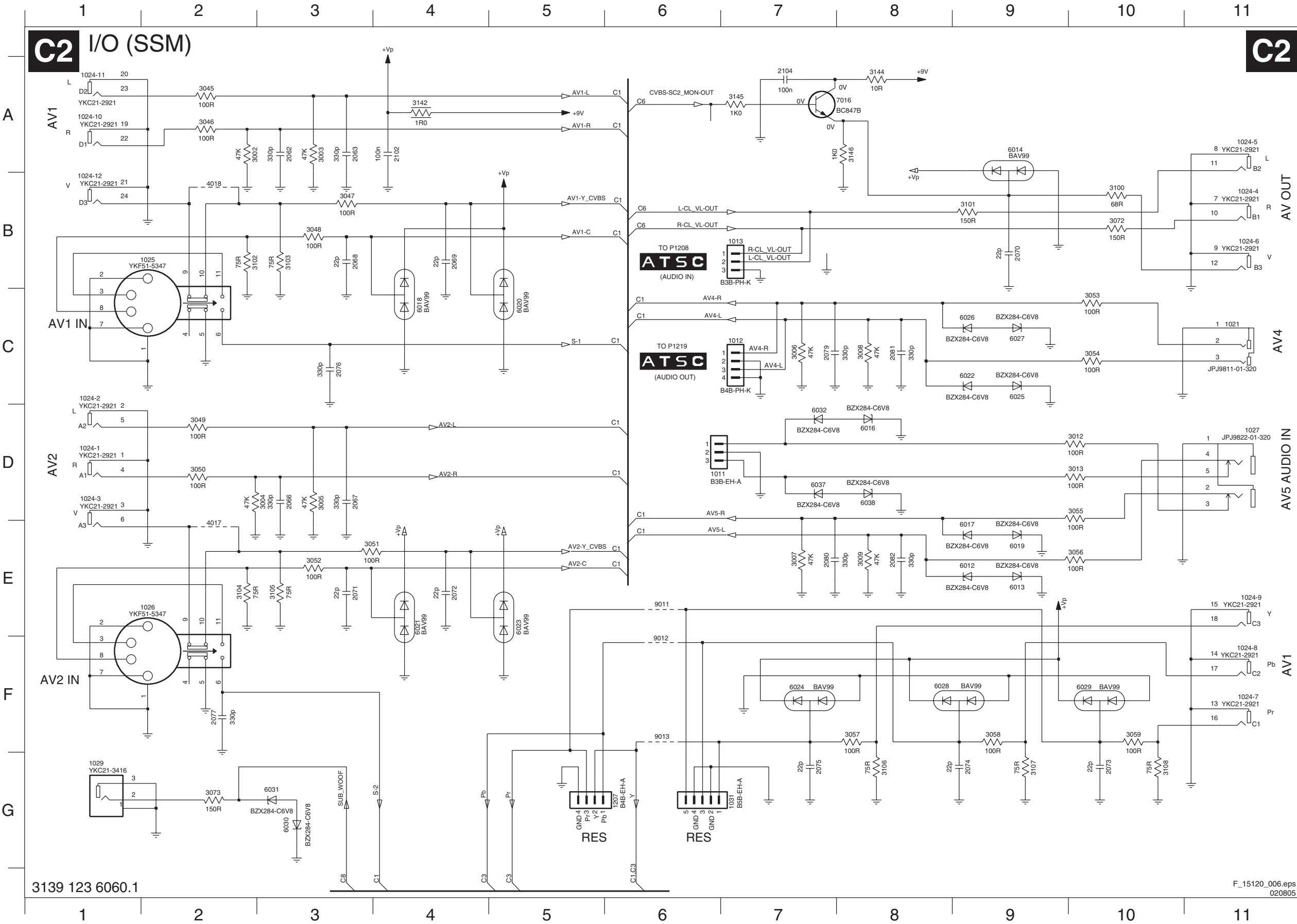
Layout SSB (Bottom Side)



C1 TUNER (SSM)

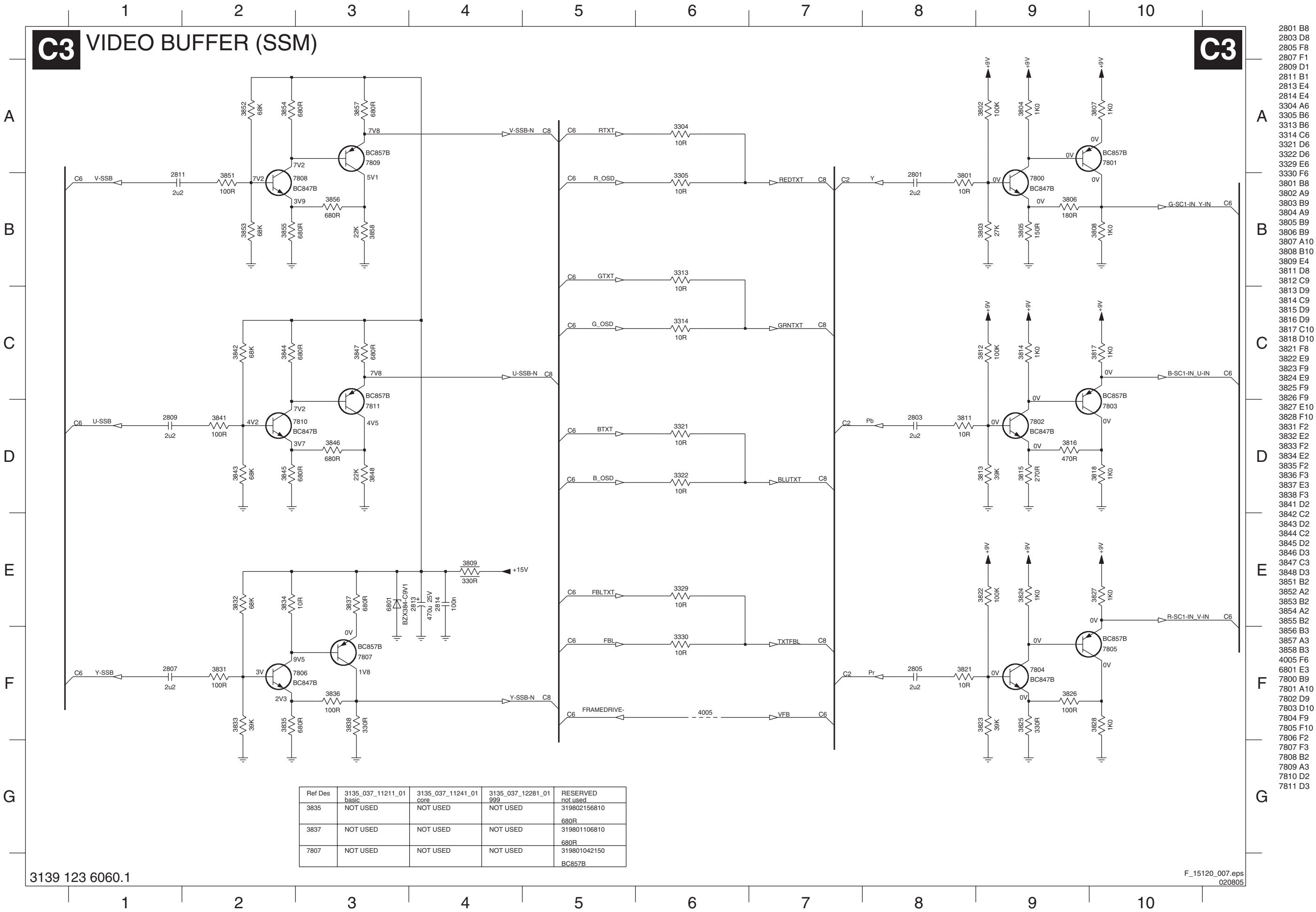


SSM: I/O's

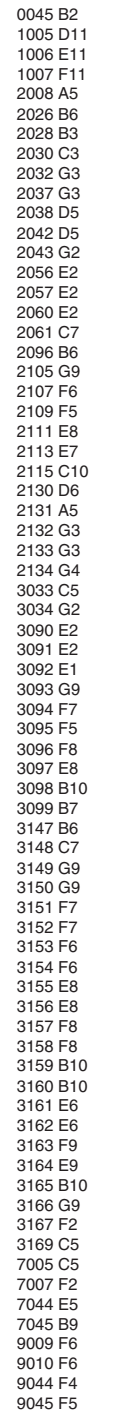


- | | |
|------------|----------|
| 1011 D6 | 6019 E9 |
| 1012 C7 | 6020 C5 |
| 1013 B7 | 6021 E4 |
| 1021 C11 | 6022 C9 |
| 1024-1 D1 | 6023 E5 |
| 1024-10 A1 | 6024 F7 |
| 1024-11 A1 | 6025 C9 |
| 1024-12 B1 | 6026 C9 |
| 1024-2 C1 | 6027 C9 |
| 1024-3 D1 | 6028 F8 |
| 1024-4 B11 | 6029 F10 |
| 1024-5 A11 | 6030 G3 |
| 1024-6 B11 | 6031 G3 |
| 1024-7 F11 | 6032 D7 |
| 1024-8 F11 | 6037 D7 |
| 1024-9 E11 | 6038 D8 |
| 1025 B2 | 7016 A7 |
| 1026 E2 | 9011 E6 |
| 1027 D11 | 9012 F6 |
| 1029 G1 | 9013 F6 |
| 1031 G7 | |
| 1207 G6 | |
| 2062 A3 | |
| 2063 A3 | |
| 2066 D3 | |
| 2067 D3 | |
| 2068 B3 | |
| 2069 B4 | |
| 2070 B9 | |
| 2071 E3 | |
| 2072 E4 | |
| 2073 G10 | |
| 2074 G9 | |
| 2075 G7 | |
| 2076 C3 | |
| 2077 F2 | |
| 2079 C7 | |
| 2080 E7 | |
| 2081 C8 | |
| 2082 E8 | |
| 2102 A4 | |
| 2104 A7 | |
| 3002 A2 | |
| 3003 A3 | |
| 3004 D3 | |
| 3005 D3 | |
| 3006 C7 | |
| 3007 E7 | |
| 3008 C8 | |
| 3009 E8 | |
| 3012 D10 | |
| 3013 D10 | |
| 3045 A2 | |
| 3046 A2 | |
| 3047 B3 | |
| 3048 B3 | |
| 3049 D2 | |
| 3050 D2 | |
| 3051 E3 | |
| 3052 E3 | |
| 3053 C10 | |
| 3054 C10 | |
| 3055 D10 | |
| 3056 E10 | |
| 3057 F8 | |
| 3058 F9 | |
| 3059 F10 | |
| 3072 B10 | |
| 3073 G2 | |
| 3100 B10 | |
| 3101 B9 | |
| 3102 B2 | |
| 3103 B3 | |
| 3104 E2 | |
| 3105 E3 | |
| 3106 G8 | |
| 3107 G9 | |
| 3108 G10 | |
| 3142 A4 | |
| 3144 A8 | |
| 3145 A7 | |
| 3146 A8 | |
| 4017 E2 | |
| 4018 B2 | |
| 6012 E9 | |
| 6013 E9 | |
| 6014 A9 | |
| 6016 D8 | |
| 6017 E9 | |
| 6018 C4 | |

SSM: Video Buffer

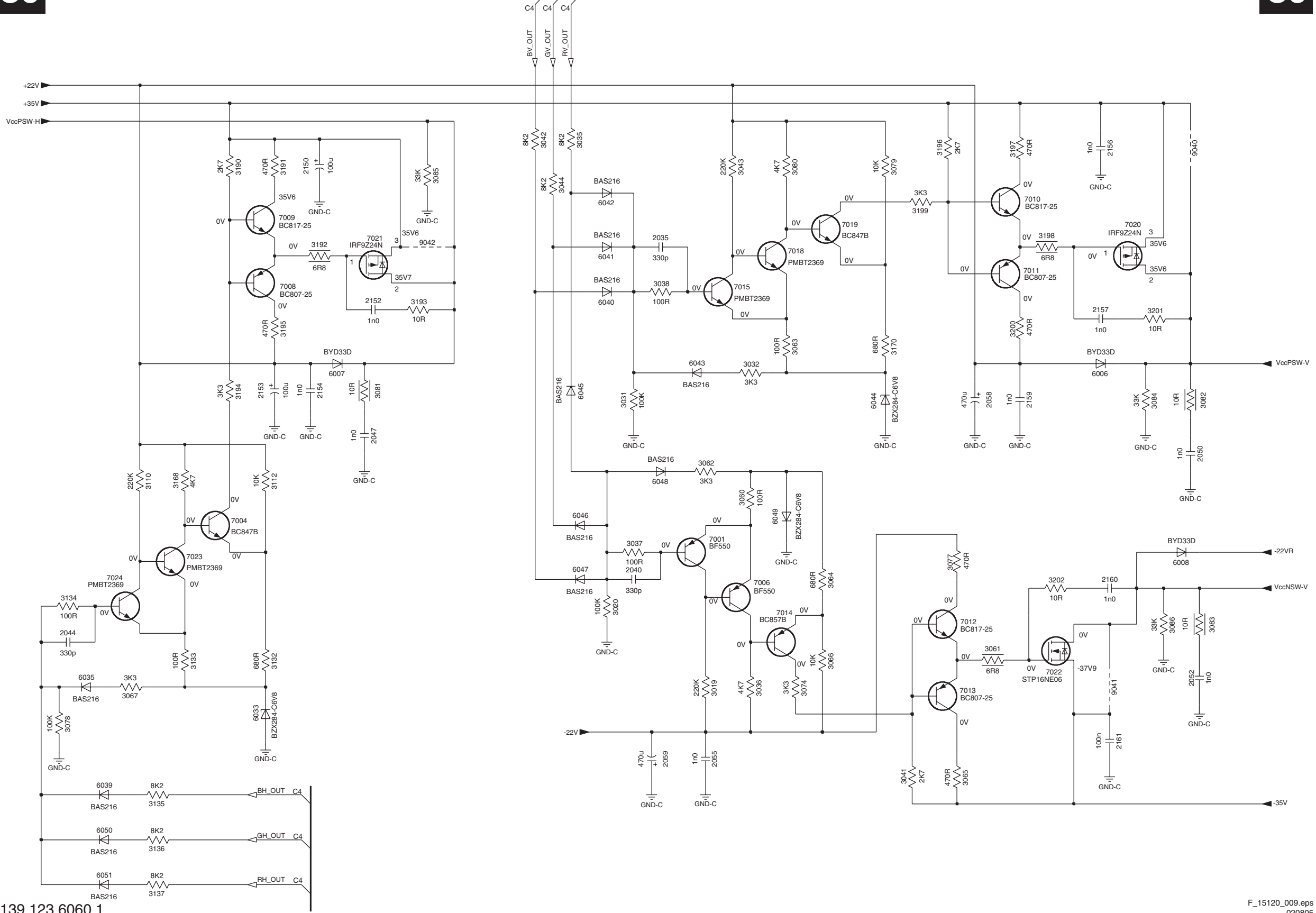


C4 CONVEGENCE HV OUTPUT 1 (SSM)



SSM: Convergence HV Output 2

C5 CONVERGENCE HV OUTPUT 2 (SSM)



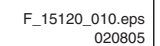
3139 123 6060.1

C5

2035 B6	7004 E2
2040 E5	7006 E6
2044 F1	7008 C3
2047 D3	7009 B3
2050 D10	7010 B8
2052 F10	7011 C8
2055 G6	7012 E8
2058 D8	7013 F8
2059 G6	7014 E6
2150 B3	7015 C6
2152 C3	7018 B7
2153 D2	7019 B7
2154 D3	7020 B9
2156 B9	7021 B3
2157 C9	7022 F9
2159 D8	7023 E2
2160 E9	7024 E1
2161 F9	9040 B10
3019 F6	9041 F9
3020 E5	9042 B4
3031 D5	
3032 C6	
3035 B5	
3036 F6	
3037 E5	
3038 C6	
3041 G8	
3042 B5	
3043 B6	
3044 B5	
3060 D6	
3061 F8	
3062 D6	
3063 C7	
3064 E7	
3065 G8	
3066 F7	
3067 F1	
3074 F7	
3077 E8	
3078 F1	
3079 B7	
3080 B7	
3081 D3	
3082 D10	
3083 E10	
3084 D9	
3085 B4	
3086 E10	
3110 D1	
3112 D2	
3132 F2	
3133 F2	
3134 E1	
3135 G2	
3136 G2	
3137 G2	
3168 D2	
3170 C7	
3190 B2	
3191 B3	
3192 B3	
3193 C4	
3194 D2	
3195 C3	
3196 B8	
3197 B8	
3198 B9	
3199 B8	
3200 C8	
3201 C9	
3202 E9	
6006 C9	
6007 C3	
6008 E10	
6033 F2	
6035 F1	
6039 G1	
6040 C5	
6041 C5	
6042 B5	
6043 C6	
6044 D7	
6045 D5	
6046 E5	
6047 E5	
6048 D6	
6049 E6	
6050 G1	
6051 G1	
7001 E6	

F_15120_009.eps
020805

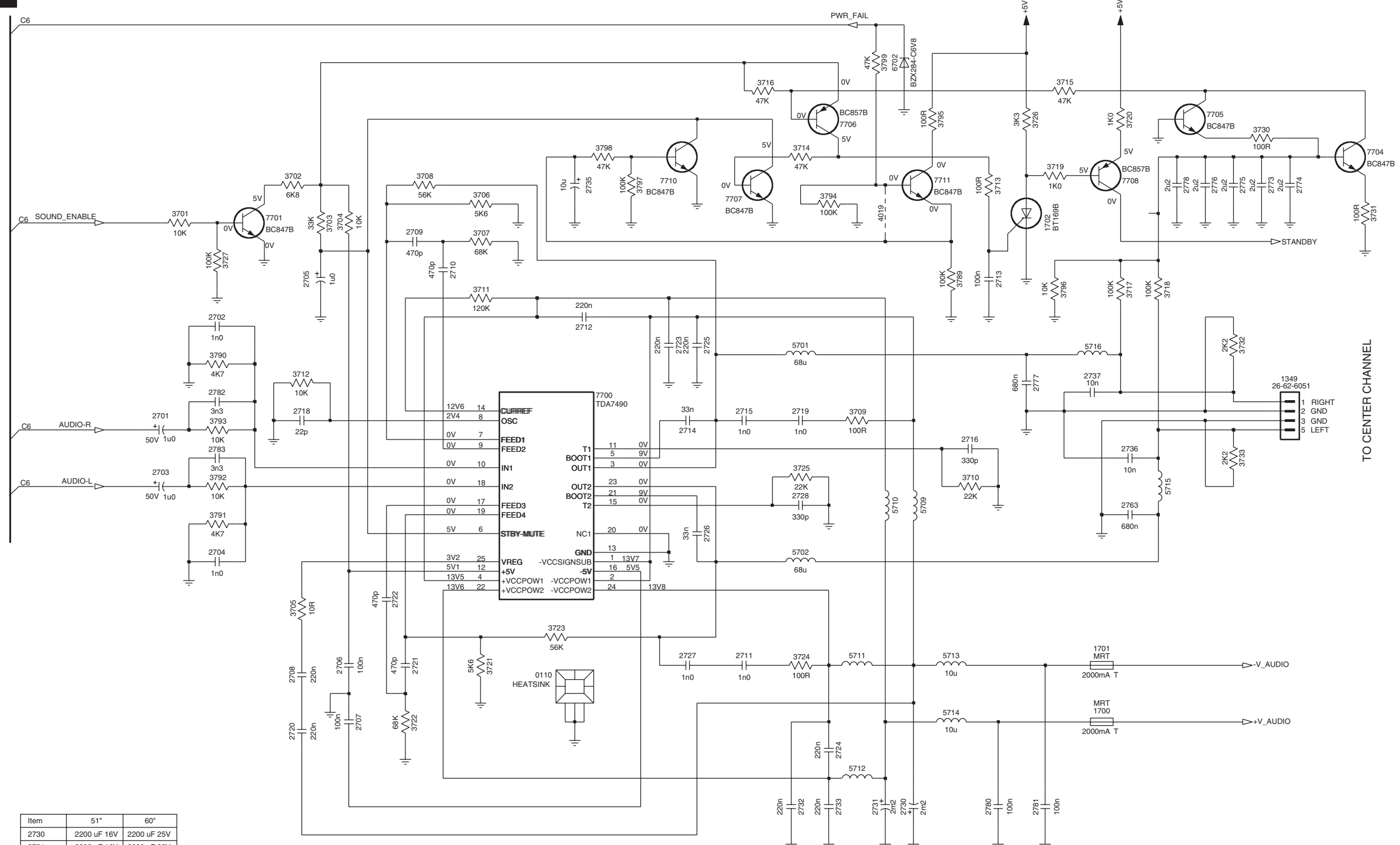
C6 INTERCONNECTIONS (SSM)



1001 E8	9018 D5
10102 D8	9019 D3
10103 D7	9020 F5
10104 G8	9030 B7
10105 G9	9031 B7
1000 A6	9032 B8
1001 A11	9033 B9
1014 H4	
1020-A C4	
1020-B C4	
1033 H6	
1043 A1	
1200 C2	
1201 F1	
1272 C1	
1516 F11	
1518 D11	
1681 G1	
1950 A9	
2001 E7	
2002 H3	
2003 E8	
2004 D9	
2005 C8	
2006 B9	
2007 C8	
2010 E8	
2011 D9	
2012 H2	
2024 D1	
2027 C7	
2029 H2	
2031 B3	
2033 E9	
2034 E2	
2036 A10	
2039 C9	
2041 A9	
2045 C2	
2046 B4	
2048 B4	
2049 A10	
2053 G7	
2054 G7	
2097 G8	
2098 G9	
3001 E1	
3010 B4	
3014 E1	
3017 B3	
3018 C1	
3025 G3	
3039 B4	
3068 A4	
3069 A3	
3070 B3	
3071 B5	
3111 D5	
3182 C5	
3183 C6	
4004 F5	
4006 D5	
4007 F5	
4008 D5	
4009 D5	
4010 C2	
4015 B3	
5000 A9	
5001 A10	
5002 F10	
5003 F10	
5004 F10	
5005 G2	
5006 G2	
5008 H2	
5009 B2	
5010 B3	
5011 C8	
6001 E7	
6002 C8	
6003 C7	
6004 E2	
6005 F9	
6009 D2	
6015 F7	
6036 D9	
7025 B4	
7026 A5	
7101 E8	
7102 C8	
7103 C7	
7104 G7	
7105 G9	
9007 D3	
9016 D3	
9017 D1	

SSM: Audio Amplifier

C7 AUDIO AMPLIFIER (SSM)

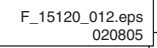


Item	51"	60"
2730	2200 uF 16V	2200 uF 25V
2731	2200 uF 16V	2200 uF 25V
7700	TDA7490L	TDA7490

Ref Des	3135_037_11211_01 basic	3135_037_11241_01 core	3135_037_12281_01 999	RESERVED not used
4019	NOT USED	NOT USED	319802190020	NOT USED

- 0110 F5
- 1349 D11
- 1700 F9
- 1701 F9
- 1702 C9
- 2701 D2
- 2702 C2
- 2703 D2
- 2704 E2
- 2705 C3
- 2706 F3
- 2707 F3
- 2708 F3
- 2709 C4
- 2710 C4
- 2711 F6
- 2712 C5
- 2713 C8
- 2714 D6
- 2715 D6
- 2716 D8
- 2718 D3
- 2719 D7
- 2720 F3
- 2721 F4
- 2722 E4
- 2723 C6
- 2724 G7
- 2725 C6
- 2726 E6
- 2727 F6
- 2728 E7
- 2730 G8
- 2731 G7
- 2732 G7
- 2733 G7
- 2735 B5
- 2736 D9
- 2737 D9
- 2763 E9
- 2773 B10
- 2774 B11
- 2775 B10
- 2776 B10
- 2777 D9
- 2778 B10
- 2780 G8
- 2781 G9
- 2782 D2
- 2783 D2
- 3701 B2
- 3702 B3
- 3703 C3
- 3704 C3
- 3705 E3
- 3706 B4
- 3707 C4
- 3708 B4
- 3709 D7
- 3710 D8
- 3711 C4
- 3712 D3
- 3713 B8
- 3714 B7
- 3715 A9
- 3716 A7
- 3717 C9
- 3718 C10
- 3719 B9
- 3720 B9
- 3721 F4
- 3722 F4
- 3723 F5
- 3724 F7
- 3725 D7
- 3726 B9
- 3727 C2
- 3730 B10
- 3731 B11
- 3732 C10
- 3733 D10
- 3789 C8
- 3790 D2
- 3791 E2
- 3792 D2
- 3793 D2
- 3794 B7
- 3795 B8
- 3796 C9
- 3797 B6
- 3798 B5
- 3799 A7
- 4019 B7
- 5701 C7
- 5702 E7
- 5709 E8
- 5710 E8
- 5711 F7
- 5712 G7
- 5713 F8
- 5714 F8
- 5715 E10
- 5716 C9
- 6702 A8
- 7700 D5
- 7701 B3
- 7704 B11
- 7705 B10
- 7706 B7
- 7707 B6
- 7708 B9
- 7710 B6
- 7711 B8

C8 HEADPHONE AMPLIFIER (SSM)



Mapping SSM C1-C8 Part 1

C10 SMALL SIGNAL MODULE (AP)

REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE
0001	7-G5	1606	8-F2	2060	4-F1	2160	5-G11	3058	2-H10	3333	5-F2	3440	8-B11		
0045	4-C2	1607	88-F2	2061	4-D8	2161	5-H11	3059	2-H12	3341	5-F7	3441	88-B11		
0101	6-G10	1608	88-G2	2062	2-B3	2111	8-B2	3060	5-F8	3342	5-G4	3442	88-B10		
0102	6-E10	1609	88-H2	2063	4-B4	2112	88-C2	3061	5-F9	3343	5-G5	3443	88-B10		
0103	6-F8	1610	8-I12	2064	4-B8	2113	88-C3	3062	5-F7	3344	5-G6	3444	88-B10		
0104	6-G8	1611	88-G4	2065	4-B8	2114	88-C4	3063	5-F7	3345	5-G7	3445	88-B10		
0105	6-I11	1681	7-I12	2066	2-F3	2115	88-C5	3064	5-F7	3346	5-G8	3446	88-B10		
0106	8-C8	1700	7-H11	2067	2-F4	2116	88-C6	3065	5-F7	3347	5-G9	3447	88-B10		
1000	6-A8	1701	7-G11	2068	2-F4	2117	88-C7	3066	5-F7	3348	5-G10	3448	88-B10		
1001	6-B13	1702	7-C10	2069	2-C5	2118	88-C8	3067	5-F7	3349	5-G11	3449	88-B10		
1002	1-H6	1950	6-A10	2070	2-C10	2119	88-C9	3068	5-F7	3350	5-G12	3450	88-B10		
1003	1-H6	2000	6-F3	2071	2-C10	2120	88-C10	3069	5-F7	3351	5-G13	3451	88-B10		
1005	4-F13	2001	6-F3	2072	2-C10	2121	88-C11	3070	5-F7	3352	5-G14	3452	88-B10		
1006	4-F13	2002	6-J3	2073	2-C10	2122	88-C12	3071	5-F7	3353	5-G15	3453	88-B10		
1007	4-H13	2003	6-F10	2074	2-I10	2123	88-C13	3072	5-F7	3354	5-G16	3454	88-B10		
1008	1-A10	2004	6-D10	2075	2-I8	2124	88-C14	3073	5-F7	3355	5-G17	3455	88-B10		
1009	1-G2	2005	6-D9	2076	2-D4	2125	88-C15	3074	5-F7	3356	5-G18	3456	88-B10		
1010	1-F6	2006	6-C10	2077	2-H3	2126	88-C16	3075	5-F7	3357	5-G19	3457	88-B10		
1011	1-E8	2007	6-D9	2078	2-F4	2127	88-C17	3076	5-F7	3358	5-G20	3458	88-B10		
1014	6-A4	2008	8-B6	2079	2-D9	2128	88-C18	3077	5-F7	3359	5-G21	3459	88-B10		
1015	1-H7	2009	8-F9	2080	2-D9	2129	88-C19	3078	5-F7	3360	5-G22	3460	88-B10		
1016	1-F8	2010	6-F9	2081	2-D9	2130	88-C20	3079	5-F7	3361	5-G23	3461	88-B10		
1017	1-C10	2011	6-D10	2082	2-F3	2131	88-C21	3080	5-F7	3362	5-G24	3462	88-B10		
1018	1-D10	2012	6-D10	2083	2-F3	2132	88-C22	3081	5-F7	3363	5-G25	3463	88-B10		
1020-A	6-C4	2013	1-G4	2084	1-G4	2133	88-C23	3082	5-F7	3364	5-G26	3464	88-B10		
1020-B	6-C4	2014	1-G4	2085	1-G4	2134	88-C24	3083	5-F7	3365	5-G27	3465	88-B10		
1021	2-D13	2015	1-G4	2086	1-G4	2135	88-C25	3084	5-F7	3366	5-G28	3466	88-B10		
1022-A	1-F13	2016	1-G4	2087	1-G4	2136	88-C26	3085	5-F7	3367	5-G29	3467	88-B10		
1022-B	1-F13	2017	1-G4	2088	1-G4	2137	88-C27	3086	5-F7	3368	5-G30	3468	88-B10		
1022-C	1-F13	2018	1-G4	2089	1-G4	2138	88-C28	3087	5-F7	3369	5-G31	3469	88-B10		
1022-D	1-F13	2019	1-G4	2090	1-G4	2139	88-C29	3088	5-F7	3370	5-G32	3470	88-B10		
1022-E	1-F13	2020	1-G4	2091	1-G4	2140	88-C30	3089	5-F7	3371	5-G33	3471	88-B10		
1022-F	1-F13	2021	1-G4	2092	1-G4	2141	88-C31	3090	5-F7	3372	5-G34	3472	88-B10		
1022-G	1-F13	2022	1-G4	2093	1-G4	2142	88-C32	3091	5-F7	3373	5-G35	3473	88-B10		
1022-H	1-F13	2023	1-G4	2094	1-G4	2143	88-C33	3092	5-F7	3374	5-G36	3474	88-B10		
1022-I	1-F13	2024	1-G4	2095	1-G4	2144	88-C34	3093	5-F7	3375	5-G37	3475	88-B10		
1022-J	1-F13	2025	1-G4	2096	1-G4	2145	88-C35	3094	5-F7	3376	5-G38	3476	88-B10		
1022-K	1-F13	2026	1-G4	2097	1-G4	2146	88-C36	3095	5-F7	3377	5-G39	3477	88-B10		
1022-L	1-F13	2027	1-G4	2098	1-G4	2147	88-C37	3096	5-F7	3378	5-G40	3478	88-B10		
1022-M	1-F13	2028	1-G4	2099	1-G4	2148	88-C38	3097	5-F7	3379	5-G41	3479	88-B10		
1022-N	1-F13	2029	1-G4	2100	1-G4	2149	88-C39	3098	5-F7	3380	5-G42	3480	88-B10		
1022-O	1-F13	2030	1-G4	2101	1-G4	2150	88-C40	3099	5-F7	3381	5-G43	3481	88-B10		
1022-P	1-F13	2031	1-G4	2102	1-G4	2151	88-C41	3100	5-F7	3382	5-G44	3482	88-B10		
1022-Q	1-F13	2032	1-G4	2103	1-G4	2152	88-C42	3101	5-F7	3383	5-G45	3483	88-B10		
1022-R	1-F13	2033	1-G4	2104	1-G4	2153	88-C43	3102	5-F7	3384	5-G46	3484	88-B10		
1022-S	1-F13	2034	1-G4	2105	1-G4	2154	88-C44	3103	5-F7	3385	5-G47	3485	88-B10		
1022-T	1-F13	2035	1-G4	2106	1-G4	2155	88-C45	3104	5-F7	3386	5-G48	3486	88-B10		
1022-U	1-F13	2036	1-G4	2107	1-G4	2156	88-C46	3105	5-F7	3387	5-G49	3487	88-B10		
1022-V	1-F13	2037	1-G4	2108	1-G4	2157	88-C47	3106	5-F7	3388	5-G50	3488	88-B10		
1022-W	1-F13	2038	1-G4	2109	1-G4	2158	88-C48	3107	5-F7	3389	5-G51	3489	88-B10		
1022-X	1-F13	2039	1-G4	2110	1-G4	2159	88-C49	3108	5-F7	3390	5-G52	3490	88-B10		
1022-Y	1-F13	2040	1-G4	2111	1-G4	2160	88-C50	3109	5-F7	3391	5-G53	3491	88-B10		
1022-Z	1-F13	2041	1-G4	2112	1-G4	2161	88-C51	3110	5-F7	3392	5-G54	3492	88-B10		
1022-AA	1-F13	2042	1-G4	2113	1-G4	2162	88-C52	3111	5-F7	3393	5-G55	3493	88-B10		
1022-AB	1-F13	2043	1-G4	2114	1-G4	2163	88-C53	3112	5-F7	3394	5-G56	3494	88-B10		
1022-AC	1-F13	2044	1-G4	2115	1-G4	2164	88-C54	3113	5-F7	3395	5-G57	3495	88-B10		
1022-AD	1-F13	2045	1-G4	2116	1-G4	2165	88-C55	3114	5-F7	3396	5-G58	3496	88-B10		
1022-AE	1-F13	2046	1-G4	2117	1-G4	2166	88-C56	3115	5-F7	3397	5-G59	3497	88-B10		
1022-AF	1-F13	2047	1-G4	2118	1-G4	2167	88-C57	3116	5-F7	3398	5-G60	3498	88-B10		
1022-AG	1-F13	2048	1-G4	2119	1-G4	2168	88-C58	3117	5-F7	3399	5-G61	3499	88-B10		
1022-AH	1-F13	2049	1-G4	2120	1-G4	2169	88-C59	3118	5-F7	3400	5-G62	3500	88-B10		
1022-AI	1-F13	2050	1-G4	2121	1-G4	2170	88-C60	3119	5-F7	3401	5-G63	3501	88-B10		
1022-AJ	1-F13	2051	1-G4	2122	1-G4	2171	88-C61	3120	5-F7	3402	5-G64	3502	88-B10		
1022-AM	1-F13	2052	1-G4	2123	1-G4	2172	88-C62	3121	5-F7	3403	5-G65	3503	88-B10		
1022-AN	1-F13	2053	1-G4	2124	1-G4	2173	88-C63	3122	5-F7	3404	5-G66	3504	88-B10		
1022-AO	1-F13	2054	1-G4	2125	1-G4	2174	88-C64	3123	5-F7	3405	5-G67	3505	88-B10		
1022-AP	1-F13	2055	1-G4	2126	1-G4	2175	88-C65	3124	5-F7	3406	5-G68	3506	88-B10		
1022-AQ	1-F13	2056	1-G4	2127	1-G4	2176	88-C66	3125	5-F7	3407	5-G69	3507	88-B10		
1022-AR	1-F13	2057	1-G4	2128	1-G4	2177	88-C67	3126	5-F7	3408	5-G70	3508	88-B10		
1022-AS	1-F13	2058	1-G4	2129	1-G4	2178	88-C68	3127	5-F7	3409	5-G71	3509	88-B10		
1022-AT	1-F13	2059	1-G4	2130	1-G4	2179	88-C69	3128	5-F7	3410	5-G72	3510	88-B10		
1022-AU	1-F13	2060	1-G4	2131	1-G4	2180	88-C70	3129	5-F7	3411	5-G73	3511	88-B10		
1022-AV	1-F13	2061	1-G4	2132	1-G4	2181	88-C71	3130	5-F7	3412	5-G74	3512	88-B10		
1022-AW	1-F13	2062	1-G4	2133	1-G4	2182	88-C72	3131	5-F7	3413	5-G75	3513	88-B10		
1022-AX	1-F13	2063	1-G4	2134	1-G4	2183	88-C73	3132	5-F7	3414	5-G76	3514	88-B10		
1022-AY	1-F13	2064	1-G4	2135	1-G4	2184	88-C74	3133	5-F7	3415	5-G77	3515	88-B10		
1022-AZ	1-F13	2065	1-G4	2136	1-G4	2185	88-C75	3134	5-F7	3416	5-G78	3516	88-B10		
1022-BA	1-F13	2066	1-G4	2137	1-G4	2186	88-C76	3135	5-F7	3417	5-G79	3517	88-B10		
1022-BB	1-F13	2067	1-G4	2138	1-G4	2187	88-C77	3136	5-F7	3418	5-G80	3518	88-B10		
1022-BB	1-F13	2068	1-G4	2139	1-G4	2188	88-C78	3137	5-F7	3419	5-G81	3519	88-B10		
1022-BB	1-F13	2069	1-G4	2140	1-G4	2189	88-C79	3138	5-F7	3420	5-G82	3520	88-B10		
1022-BB	1-F13	2070	1-G4	2141	1-G4	2190	88-C80	3139	5-F7	3421	5-G83	3521	88-B10		
1022-BB	1-F13	2071	1-G4	2142	1-G4	2191	88-C81	3140	5-F7	3422	5-G84	3522	88-B10		
1022-BB	1-F13	2072	1-G4	2143	1-G4	2192	88-C82	3141	5-F7	3423	5-G85	3523	88-B10		
1022-BB	1-F13	2073	1-G4	2144	1-G4	2193	88-C83	3142	5-F7	3424	5-G86	3524	88-B10		
1022-BB	1-F13	2074	1-G4	2145	1-G4	2194	88-C84	3143	5-F7	3425	5-G87	3525	88-B10		
1022-BB	1-F13	2075	1-G4	2146	1-G4	2195	88-C85	3144	5-F7	3426	5-G88	3526	88-B10		
1022-BB	1-F13	2076	1-G4	2147	1-G4	2196	88-C86	3145	5-F7	3427	5-G89	3527	88-B10		
1022-BB	1-F13	2077	1-G4	2148	1-G4	2197	88-C87	3146	5-F7	3428	5-G90	3528	88-B10		
1022-BB	1-F13	2078	1-G4	2149	1-G4	2198	88-C88	3147	5-F7	3429	5-G91	3529	88-B10		
1022-BB	1-F13	2079	1-G4	2150	1-G4	2199	88-C89	3148	5-F7	3430	5-G92	3530	88-B10		
1022-BB	1-F13	2080	1-G4	2151	1-G4	2200	88-C90	3149	5-F7	3431	5-G93	3531	88-B10		
1022-BB	1-F13	2081	1-G												

Mapping SSM C1-C8 Part 2

C11 SMALL SIGNAL MODULE (AP)

REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE	REFDES	SH- ZONE
3827	3-G12	6004	6-F2	7021	5-C4	9037	8-12	F228	2-A2	F701	7-C1	I151	1-A3
3828	3-H12	6005	5-H10	7022	5-G10	9038	8-12	F229	2-A2	F702	7-F2	I152	1-B4
3831	3-H13	6006	5-D11	7023	5-F2	9039	8-12	F230	2-A2	F703	7-F2	I153	1-B4
3832	3-G3	6007	5-D4	7024	5-F2	9040	5-B12	F231	2-A2	F704	7-D11	I154	1-A4
3833	3-G3	6008	5-F12	7025	5-H11	9041	5-H11	F232	2-A2	F705	7-E11	I155	1-A5
3834	3-G3	6010	1-F3	7026	5-A5	9042	5-C5	F233	2-A2	F706	7-F11	I156	1-B5
3835	3-H3	6011	1-F3	7027	4-C2	9044	4-H5	F234	2-A2	F707	7-F11	I157	1-A7
3836	3-H4	6012	2-F10	7044	4-A4	9045	4-H5	F235	2-A2	F708	7-F10	I158	1-B7
3837	3-H4	6013	2-F10	7045	4-B10	9046	8-14	F236	2-A2	F709	7-F10	I159	1-B7
3838	3-H4	6014	2-B10	7101	6-F9	9047	8-14	F237	2-A2	F710	7-F10	I160	1-C7
3841	3-H4	6015	2-H8	7102	6-D10	9048	8-14	F238	2-A2	F800	8-F2	I161	1-D7
3842	3-H4	6016	2-H8	7103	6-D10			F239	2-A2	F801	8-F2	I162	1-F7
3843	3-H4	6017	2-F10	7104	6-H8			F240	2-A2	F802	8-F2	I163	1-F8
3844	3-H4	6018	2-F10	7105	6-H8			F241	2-A2	F803	8-F2	I164	1-F8
3845	3-H4	6019	2-F10	7106	6-D9			F242	2-A2	F804	8-F2	I165	1-F8
3846	3-H4	6020	2-C5	7208	1-F10			F243	2-A2	F805	8-F2	I166	1-G10
3847	3-H4	6021	2-C5	7209	1-F9			F244	2-A2	F806	8-F2	I167	1-G10
3848	3-H4	6022	2-D10	7403	8-C4			F245	2-A2	F807	8-F2	I168	1-G12
3849	3-H4	6023	2-C5	7415	8-C11			F246	2-A2	F808	8-F2	I169	1-G12
3850	3-H4	6024	2-H8	7700	7-F5			F247	2-A2	F809	8-F2	I170	1-C12
3851	3-H4	6025	2-D10	7701	7-C3			F248	2-A2	F810	8-F2	I171	1-C12
3852	3-H4	6026	2-D10	7702	7-B13			F249	2-A2	F811	8-F2	I172	1-C6
3853	3-H4	6027	2-D10	7704	7-B13			F250	2-A2	F812	8-F2	I173	1-C6
3854	3-H4	6028	2-H10	7705	7-B11			F251	2-A2	F813	8-F2	I174	1-B10
3855	3-H4	6029	2-H11	7706	7-B8			F252	2-A2	F814	8-F2	I175	1-B10
3856	3-H4	6030	2-A12	7707	7-C8			F253	2-A2	F815	8-F2	I176	1-B10
3857	3-H4	6031	2-A12	7708	7-C11			F254	2-A2	F816	8-F2	I177	1-B13
3858	3-H4	6032	2-H3	7710	7-B7			F255	2-A2	F817	8-F2	I178	1-B13
3859	3-H4	6033	2-H3	7711	7-C9			F256	2-A2	F818	8-F2	I179	1-B13
3860	3-H4	6034	2-H3	7800	7-B11			F257	2-A2	F819	8-F2	I180	1-B13
3861	3-H4	6035	2-H3	7801	7-B11			F258	2-A2	F820	8-F2	I181	1-B13
3862	3-H4	6036	2-H3	7802	7-B11			F259	2-A2	F821	8-F2	I182	1-B13
3863	3-H4	6037	2-H3	7803	7-B11			F260	2-A2	F822	8-F2	I183	1-B13
3864	3-H4	6038	2-H3	7804	7-B11			F261	2-A2	F823	8-F2	I184	1-B13
3865	3-H4	6039	2-H3	7805	7-B11			F262	2-A2	F824	8-F2	I185	1-B13
3866	3-H4	6040	2-H3	7806	7-B11			F263	2-A2	F825	8-F2	I186	1-B13
3867	3-H4	6041	2-H3	7807	7-B11			F264	2-A2	F826	8-F2	I187	1-B13
3868	3-H4	6042	2-H3	7808	7-B11			F265	2-A2	F827	8-F2	I188	1-B13
3869	3-H4	6043	2-H3	7809	7-B11			F266	2-A2	F828	8-F2	I189	1-B13
3870	3-H4	6044	2-H3	7810	7-B11			F267	2-A2	F829	8-F2	I190	1-B13
3871	3-H4	6045	2-H3	7811	7-B11			F268	2-A2	F830	8-F2	I191	1-B13
3872	3-H4	6046	2-H3	7812	7-B11			F269	2-A2	F831	8-F2	I192	1-B13
3873	3-H4	6047	2-H3	7813	7-B11			F270	2-A2	F832	8-F2	I193	1-B13
3874	3-H4	6048	2-H3	7814	7-B11			F271	2-A2	F833	8-F2	I194	1-B13
3875	3-H4	6049	2-H3	7815	7-B11			F272	2-A2	F834	8-F2	I195	1-B13
3876	3-H4	6050	2-H3	7816	7-B11			F273	2-A2	F835	8-F2	I196	1-B13
3877	3-H4	6051	2-H3	7817	7-B11			F274	2-A2	F836	8-F2	I197	1-B13
3878	3-H4	6052	2-H3	7818	7-B11			F275	2-A2	F837	8-F2	I198	1-B13
3879	3-H4	6053	2-H3	7819	7-B11			F276	2-A2	F838	8-F2	I199	1-B13
3880	3-H4	6054	2-H3	7820	7-B11			F277	2-A2	F839	8-F2	I200	1-B13
3881	3-H4	6055	2-H3	7821	7-B11			F278	2-A2	F840	8-F2	I201	1-B13
3882	3-H4	6056	2-H3	7822	7-B11			F279	2-A2	F841	8-F2	I202	1-B13
3883	3-H4	6057	2-H3	7823	7-B11			F280	2-A2	F842	8-F2	I203	1-B13
3884	3-H4	6058	2-H3	7824	7-B11			F281	2-A2	F843	8-F2	I204	1-B13
3885	3-H4	6059	2-H3	7825	7-B11			F282	2-A2	F844	8-F2	I205	1-B13
3886	3-H4	6060	2-H3	7826	7-B11			F283	2-A2	F845	8-F2	I206	1-B13
3887	3-H4	6061	2-H3	7827	7-B11			F284	2-A2	F846	8-F2	I207	1-B13
3888	3-H4	6062	2-H3	7828	7-B11			F285	2-A2	F847	8-F2	I208	1-B13
3889	3-H4	6063	2-H3	7829	7-B11			F286	2-A2	F848	8-F2	I209	1-B13
3890	3-H4	6064	2-H3	7830	7-B11			F287	2-A2	F849	8-F2	I210	1-B13
3891	3-H4	6065	2-H3	7831	7-B11			F288	2-A2	F850	8-F2	I211	1-B13
3892	3-H4	6066	2-H3	7832	7-B11			F289	2-A2	F851	8-F2	I212	1-B13
3893	3-H4	6067	2-H3	7833	7-B11			F290	2-A2	F852	8-F2	I213	1-B13
3894	3-H4	6068	2-H3	7834	7-B11			F291	2-A2	F853	8-F2	I214	1-B13
3895	3-H4	6069	2-H3	7835	7-B11			F292	2-A2	F854	8-F2	I215	1-B13
3896	3-H4	6070	2-H3	7836	7-B11			F293	2-A2	F855	8-F2	I216	1-B13
3897	3-H4	6071	2-H3	7837	7-B11			F294	2-A2	F856	8-F2	I217	1-B13
3898	3-H4	6072	2-H3	7838	7-B11			F295	2-A2	F857	8-F2	I218	1-B13
3899	3-H4	6073	2-H3	7839	7-B11			F296	2-A2	F858	8-F2	I219	1-B13
3900	3-H4	6074	2-H3	7840	7-B11			F297	2-A2	F859	8-F2	I220	1-B13
3901	3-H4	6075	2-H3	7841	7-B11			F298	2-A2	F860	8-F2	I221	1-B13
3902	3-H4	6076	2-H3	7842	7-B11			F299	2-A2	F861	8-F2	I222	1-B13
3903	3-H4	6077	2-H3	7843	7-B11			F300	2-A2	F862	8-F2	I223	1-B13
3904	3-H4	6078	2-H3	7844	7-B11			F301	2-A2	F863	8-F2	I224	1-B13
3905	3-H4	6079	2-H3	7845	7-B11			F302	2-A2	F864	8-F2	I225	1-B13
3906	3-H4	6080	2-H3	7846	7-B11			F303	2-A2	F865	8-F2	I226	1-B13
3907	3-H4	6081	2-H3	7847	7-B11			F304	2-A2	F866	8-F2	I227	1-B13
3908	3-H4	6082	2-H3	7848	7-B11			F305	2-A2	F867	8-F2	I228	1-B13
3909	3-H4	6083	2-H3	7849	7-B11			F306	2-A2	F868	8-F2	I229	1-B13
3910	3-H4	6084	2-H3	7850	7-B11			F307	2-A2	F869	8-F2	I230	1-B13
3911	3-H4	6085	2-H3	7851	7-B11			F308	2-A2	F870	8-F2	I231	1-B13
3912	3-H4	6086	2-H3	7852	7-B11			F309	2-A2	F871	8-F2	I232	1-B13
3913	3-H4	6087	2-H3	7853	7-B11			F310	2-A2	F872	8-F2	I233	1-B13
3914	3-H4	6088	2-H3	7854	7-B11			F311	2-A2	F873	8-F2	I234	1-B13
3915	3-H4	6089	2-H3	7855	7-B11			F312	2-A2	F874	8-F2	I235	1-B13
3916	3-H4	6090	2-H3	7856	7-B11			F313	2-A2	F875	8-F2	I236	1-B13
3917	3-H4	6091	2-H3	7857	7-B11			F314	2-A2	F876	8-F2	I237	1-B13
3918	3-H4	6092	2-H3	7858	7-B11			F315	2-A2	F877	8-F2	I238	1-B13
3919	3-H4	6093	2-H3	7859	7-B11			F316	2-A2	F878	8-F2	I239	1-B13
3920	3-H4	6094	2-H3	7860	7-B11			F317	2-A2	F879	8-F2	I240	1-B13
3921	3-H4	6095	2-H3	7861	7-B11			F318	2-A2	F880	8-F2	I241	1-B13
3922	3-H4	6096	2-H3	7862	7-B11			F319	2-A2	F881	8-F2	I242	1-B13
3923	3-H4	6097	2-H3	7863	7-B11			F320	2-A2	F882	8-F2	I243	1-B13
3924	3-H4	6098	2-H3	7864	7-B11			F321	2-A2	F883	8-F2	I244	1-B13
3925	3-H4	6099	2-H3	7865	7-B11			F322	2-A2	F884	8-F2	I245	1-B13
3926	3-H4	6100	2-H3	7866	7-B11			F323	2-A2	F885	8-F2	I246	1-B13
3927	3-H4	6101	2-H3	7867	7-B11			F324	2-A2	F886	8-F2	I247	1-B13
3928	3-H4	6102	2-H3	7868	7-B11			F325	2-A2	F887	8-F2	I248	1-B13
3929	3-H4	6103	2-H3	7869	7-B11			F326	2-A2	F888	8-F2	I249	1-B13
3930	3-H4	6104	2-H3	7870	7-B11			F327	2-A2	F889	8-F2	I250	1-B13
3931	3-H4	6105	2-H3	7871	7-B11			F328	2-A2	F890	8-F2	I251	1-B13
3932	3-H4	6106	2-H3	7872	7-B11			F329	2-A2	F891	8-F2	I252	1-B13
3933	3-H4	6107	2-H3	7873	7-B11			F330	2-A2	F892	8-F2	I253	1-B13
3934	3-H4	6108	2-H3	7874	7-B11			F331	2-A2	F893	8-F2	I254	1-B13
3935	3-H4	6109	2-H3	7875	7-B11			F332	2-A2	F894	8-F2	I255	1-B13
3936	3-H4	6110	2-H3	7876									

1 2 3 4

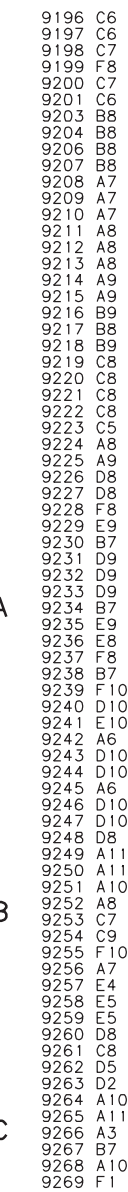
C12 SMALL SIGNAL MODULE (AP)

REFDES	SH-ZONE
I640	6-D12
I702	7-H3
I703	7-D7
I704	7-G3
I705	7-H4
I707	7-D3
I708	7-F2
I709	7-B4
I710	7-D4
I711	7-C2
I713	7-C3
I714	7-B3
I717	7-C5
I718	7-C4
I719	7-C7
I720	7-C8
I721	7-E8
I722	7-E8
I723	7-D8
I724	7-D9
I725	7-B10
I726	7-B10
I727	7-B10
I728	7-C10
I729	7-C11
I730	7-B13
I735	7-H9
I736	7-E8
I738	7-D4
I739	7-F7
I742	7-H9
I743	7-F9
I744	7-H10
I745	7-G10
I746	7-G8
I747	7-G7
I750	7-F3
I751	7-G4
I800	8-F8
I801	8-F8
I805	8-F7
I806	8-F7
I807	8-F6
I809	8-D5
I810	8-F3
I811	8-F2
I813	8-B5
I814	8-C3
I815	8-A3
I816	8-B5
I819	8-B10
I820	8-C11
I821	8-C11
I822	8-C10

E_15000_022.eps
191004

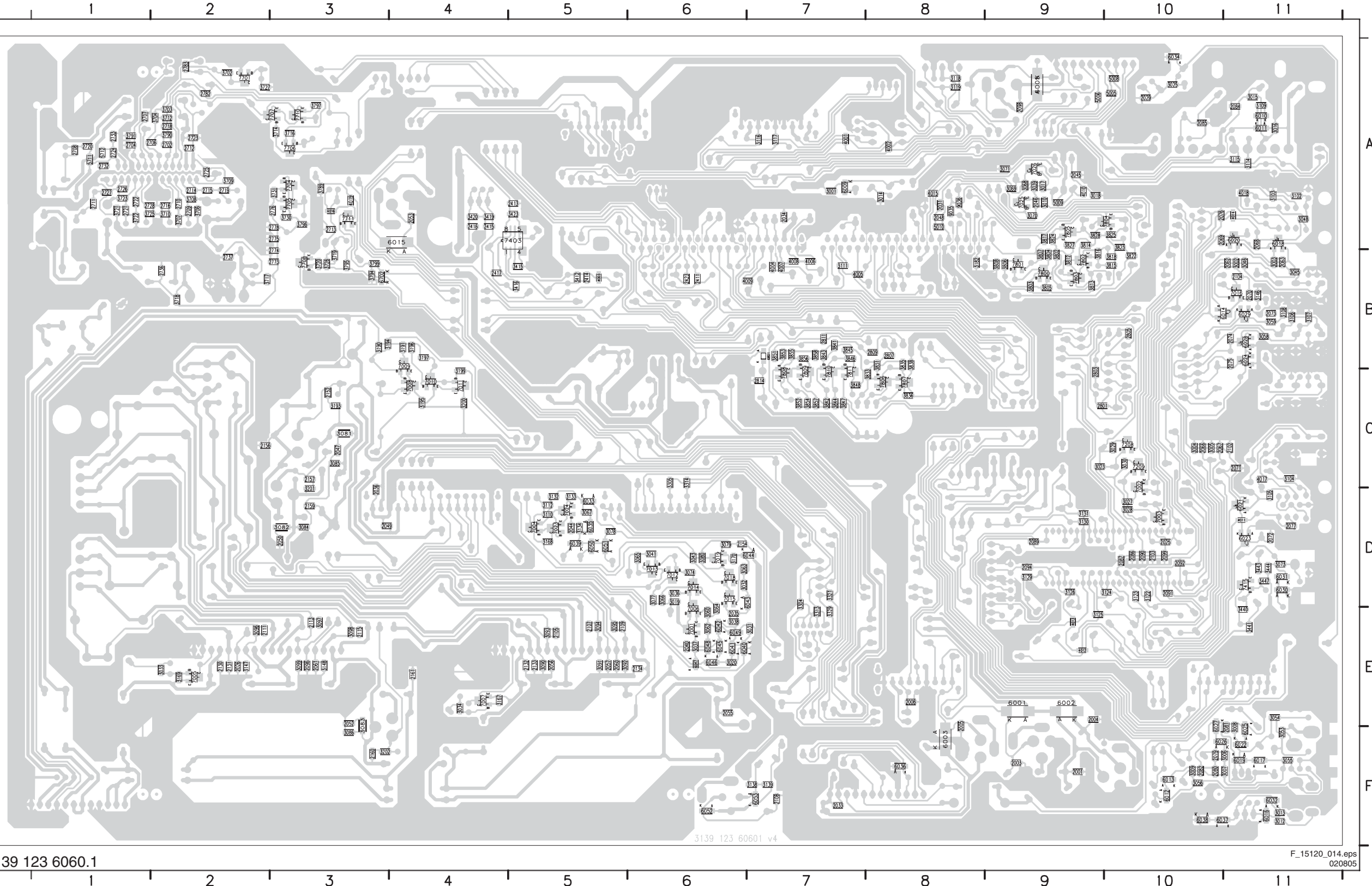
This image shows a full page of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E_06532_012.eps" and "131004".

1001	E3	1012	F1	1106	A1	1603	B7	2012	A2	2039	C7	2412	A8	3000	F4	3120	F2	3157	E11	3418	B6	3832	C5	6006	D9	9006	C4	9025	D3	9048	D5	9118	F4	9137	C3	9157	A3	9176	B6
10101	E3	1013	A6	1200	A3	1604	E11	2013	A2	2041	A4	2418	A8	3011	F4	3121	F2	3158	E11	3422	B6	3834	C4	6007	D9	9007	A5	9026	D3	9100	A1	9119	E4	9138	C3	9158	C3	9176	C5
10102	F2	1014	A8	1201	A3	1605	B7	2014	F2	2042	E11	2421	A7	3021	D2	3127	F2	3159	E11	3442	D2	3837	C4	6008	F8	9008	C4	9027	C3	9101	A2	9120	E4	9139	C3	9159	A5	9179	C5
10103	F3	1015	B3	1206	C6	1606	C5	2015	F2	2043	E8	2440	B6	3022	C2	3128	E2	3160	C10	3701	A9	5000	C7	7017	D2	9009	B8	9028	A7	9102	A2	9121	E3	9140	C3	9160	A2	9180	E6
10104	A9	1016	A2	1207	C2	1607	A9	2016	E2	2054	A8	2441	D1	3024	D2	3135	D7	3161	C10	3705	A11	5001	C7	7020	C9	9010	B8	9029	A7	9103	A2	9122	E4	9141	C3	9161	A3	9181	E6
10105	A4	1017	A4	1222	A4	1608	C1	2017	E2	2058	B9	2442	E1	3026	A2	3136	D7	3162	D10	3711	A10	5002	E11	7021	C9	9011	B2	9030	D4	9104	A2	9123	E4	9142	B3	9162	A5	9182	E5
10106	F6	1018	A4	1250	E1	1609	C3	2018	E2	2059	B5	2467	B7	3035	D9	3137	D7	3163	E11	3713	A9	5003	E11	7022	F8	9012	C2	9031	D4	9105	A2	9124	F5	9143	B3	9163	A5	9183	C5
10110	A11	1020	A5	1272	A3	1610	D5	2019	E2	2078	A1	2701	B6	3042	D9	3140	F5	3164	D11	3715	A9	5004	F6	7044	E7	9013	C2	9032	D4	9106	A3	9125	D4	9144	B3	9164	B4	9184	D7
1000	D6	1021	F1	1301	B4	1681	A3	2020	D3	2083	A1	2703	A9	3044	D9	3142	B2	3165	C10	3724	A11	5007	A3	7045	E10	9014	B2	9033	D4	9107	B2	9126	D4	9145	B3	9165	B4	9185	C9
1001	D8	1025	A1	1302	A2	1700	B11	2021	D3	2088	E3	2705	A10	3047	A1	3145	B2	3166	D11	3732	B10	5011	E5	7101	F3	9015	B2	9037	E5	9108	C2	9127	D4	9146	B3	9166	B4	9186	C9
1002	A2	1026	C1	1303	A4	1701	B11	2022	F1	2093	E3	2730	A11	3049	C1	3146	B2	3174	C3	3733	B10	5701	A10	7102	F2	9016	A5	9038	E5	9109	E2	9128	D4	9148	B3	9167	B4	9187	F3
1003	A1	1027	F1	1335	D4	1702	A9	2023	F2	2095	C3	2731	A11	3050	C1	3149	D10	3175	C3	3792	A10	5702	A11	7103	F3	9017	A5	9039	C5	9110	E2	9129	D4	9149	A3	9168	B4	9188	F3
1005	C10	1028	A1	1344	A8	1950	E4	2024	A4	2097	A4	2735	B9	3051	D1	3150	D10	3176	D2	3793	A10	5709	A10	7104	A8	9018	B5	9040	D9	9111	B2	9130	D4	9150	A3	9169	B4	9189	F3
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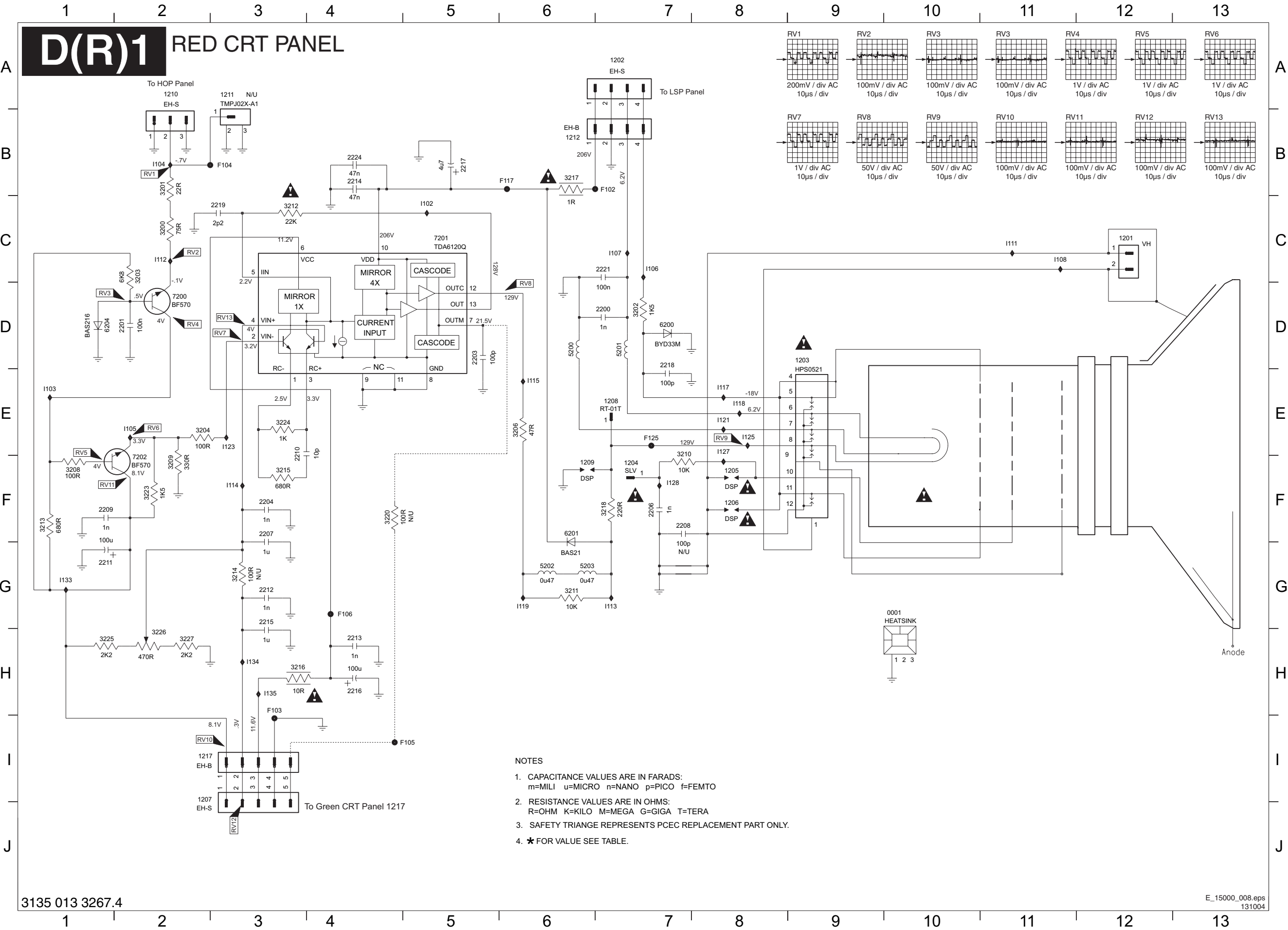


Layout SSM (Bottom Side)

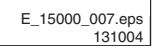
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2003 F9	2050 D3	2075 B11	2102 C11	2159 D3	2713 A3	2773 B3	3006 F11	3030 C10	3059 B11	3082 D3	3106 B11	3130 D9	3195 C4	3440 E11	3720 B3	3804 B9	3833 C8	3858 B7	4019 A3	6016 F11
2004 E9	2052 E3	2076 A10	2103 D10	2160 F3	2714 A2	2774 B3	3007 F11	3031 E7	3060 E6	3083 E3	3107 B11	3131 D9	3196 B4	3441 E11	3721 A1	3805 B9	3835 B8	4001 A7	5005 A10	6017 F11
2005 E8	2053 A4	2077 D11	2104 B11	2161 E4	2715 A2	2775 A3	3008 F11	3032 D6	3062 E6	3084 D3	3108 B11	3132 D5	3197 B4	3443 D11	3722 A1	3806 B9	3836 C8	4002 A8	5006 A9	6018 A11
2006 E8	2055 E6	2079 F10	2105 E5	2411 B6	2716 A2	2776 A3	3009 F10	3033 E2	3063 D6	3085 C3	3109 A11	3133 D5	3199 C4	3444 D11	3723 A1	3807 B9	3838 B8	4003 B5	5008 A10	6019 F11
2025 D10	2056 E5	2080 F10	2107 E5	2413 A5	2718 A2	2778 A3	3010 A9	3034 E4	3064 E6	3086 F3	3110 D5	3134 D5	3200 C4	3447 D11	3725 A1	3808 B9	3841 B7	4004 B7	5009 A9	6020 A11
2026 E2	2057 E5	2081 F11	2108 F7	2414 B5	2719 A2	2782 A2	3012 F11	3036 D6	3065 D6	3090 E5	3111 B7	3138 F7	3201 D3	3702 A2	3726 B3	3812 B9	3842 C7	4005 B7	5010 A8	6021 D11
2029 A10	2060 E5	2082 F10	2109 E5	2415 A4	2720 A1	2783 A2	3013 F11	3037 E6	3066 D6	3091 E5	3112 D5	3139 F7	3202 F3	3703 A2	3727 A2	3813 B9	3843 B7	4006 B7	5711 A1	6022 F11
2031 A8	2061 E3	2084 A11	2111 E2	2416 A4	2721 A1	2801 C9	3014 A8	3038 E6	3067 D5	3092 E5	3114 A11	3146 B11	3304 D7	3704 A2	3730 A3	3814 A9	3844 C7	4007 B7	5712 A1	6023 D11
2033 F7	2062 B11	2085 A10	2113 E3	2417 B4	2722 A1	2803 C9	3015 A11	3039 A9	3068 A9	3093 E5	3115 A11	3147 E2	3305 C6	3706 A2	3731 A3	3815 B10	3845 B7	4008 B7	6001 E9	6024 B11
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2035 E6	2066 C10	2087 D10	2130 E2	2702 A2	2724 A1	2807 B8	3017 A9	3043 D6	3070 A9	3095 E5	3117 A7	3167 E4	3314 C6	3708 A2	3790 A2	3817 A9	3847 C7	4010 A9	6003 F8	6026 F10
2036 D3	2067 C10	2089 D9	2131 E2	2704 A1	2725 A2	2809 B8	3018 A9	3045 B11	3071 A9	3096 E2	3118 A8	3168 D5	3321 D7	3709 A2	3791 A1	3818 B10	3848 C7	4011 D11	6005 A9	6027 E10
2040 E6	2068 A11	2090 D10	2132 E5	2706 A2	2726 A1	2811 B7	3019 D6	3046 B11	3073 D11	3097 E3	3119 A8	3169 E2	3329 E7	3710 A2	3794 B3	3822 B10	3851 B7	4012 E9	6009 A7	6028 B11
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2046 A9	2071 C11	2094 D9	2152 C3	2709 A2	2732 A1	3002 B11	3025 A10	3054 E11	3078 D5	3102 A11	3124 D10	3190 B3	3416 B5	3716 A3	3797 A3	3825 A10	3854 C7	4015 A8	6012 F10	6031 D11
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2048 A8	2073 B11	2098 A9	2156 C2	2711 A1	2736 B2	3004 C10	3028 D10	3056 F10	3080 D6	3104 C11	3126 D9	3193 C3	3420 A4	3718 B2	3802 B9	3828 A9	3856 B7	4017 C11	6014 B10	6033 D5



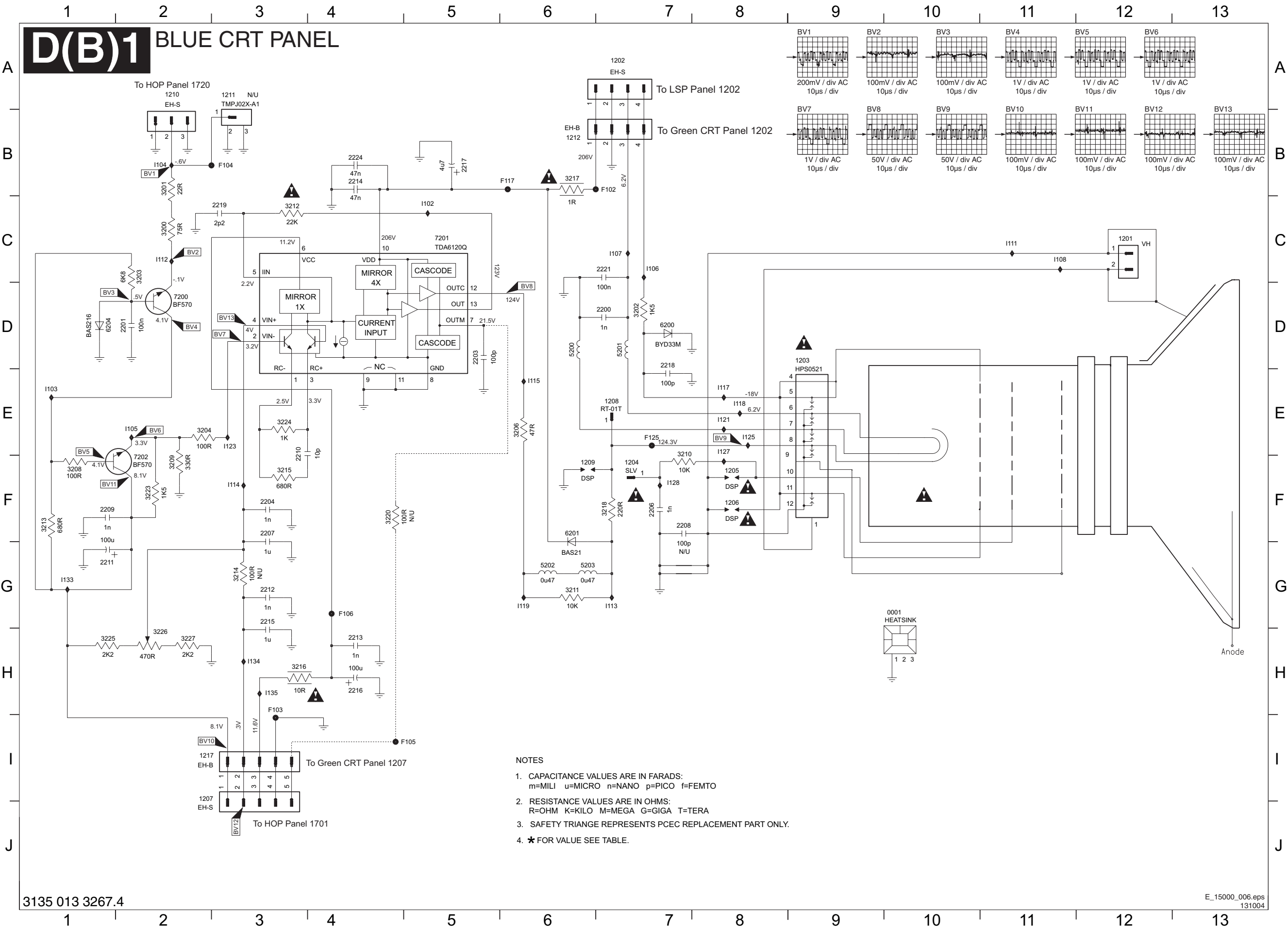
CRT Panel: Red



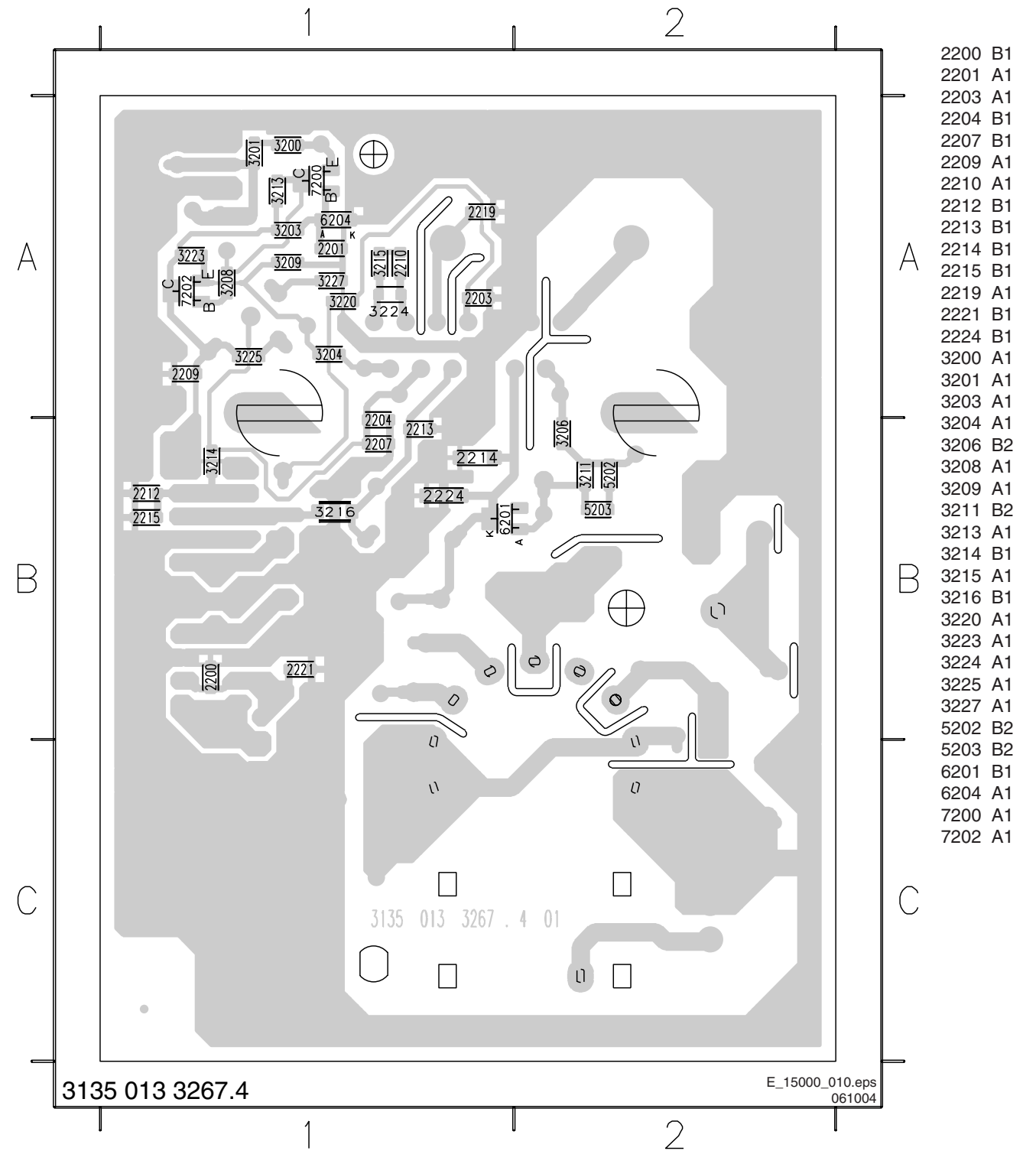
D(G)1 GREEN CRT PANEL



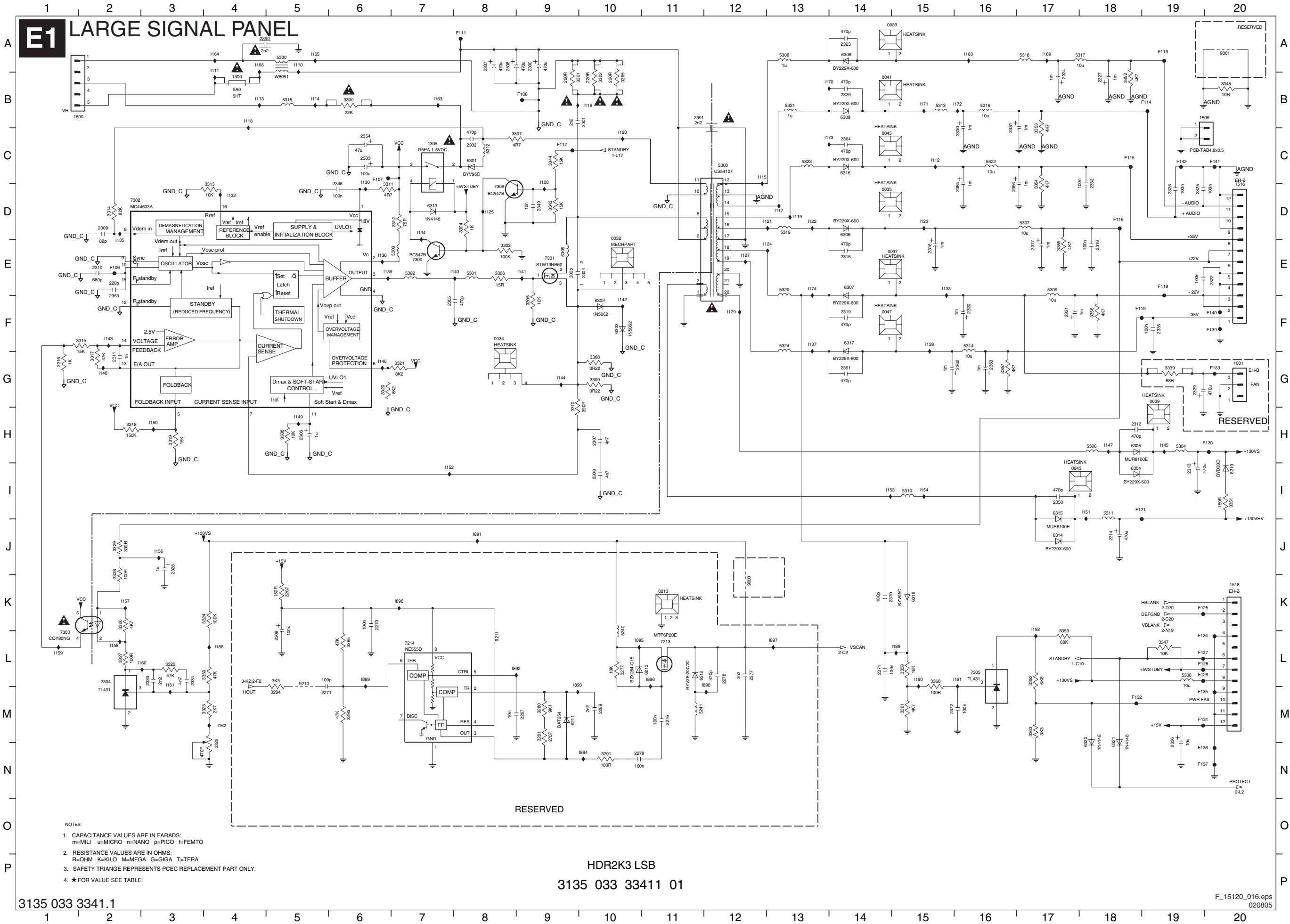
CRT Panel: Blue



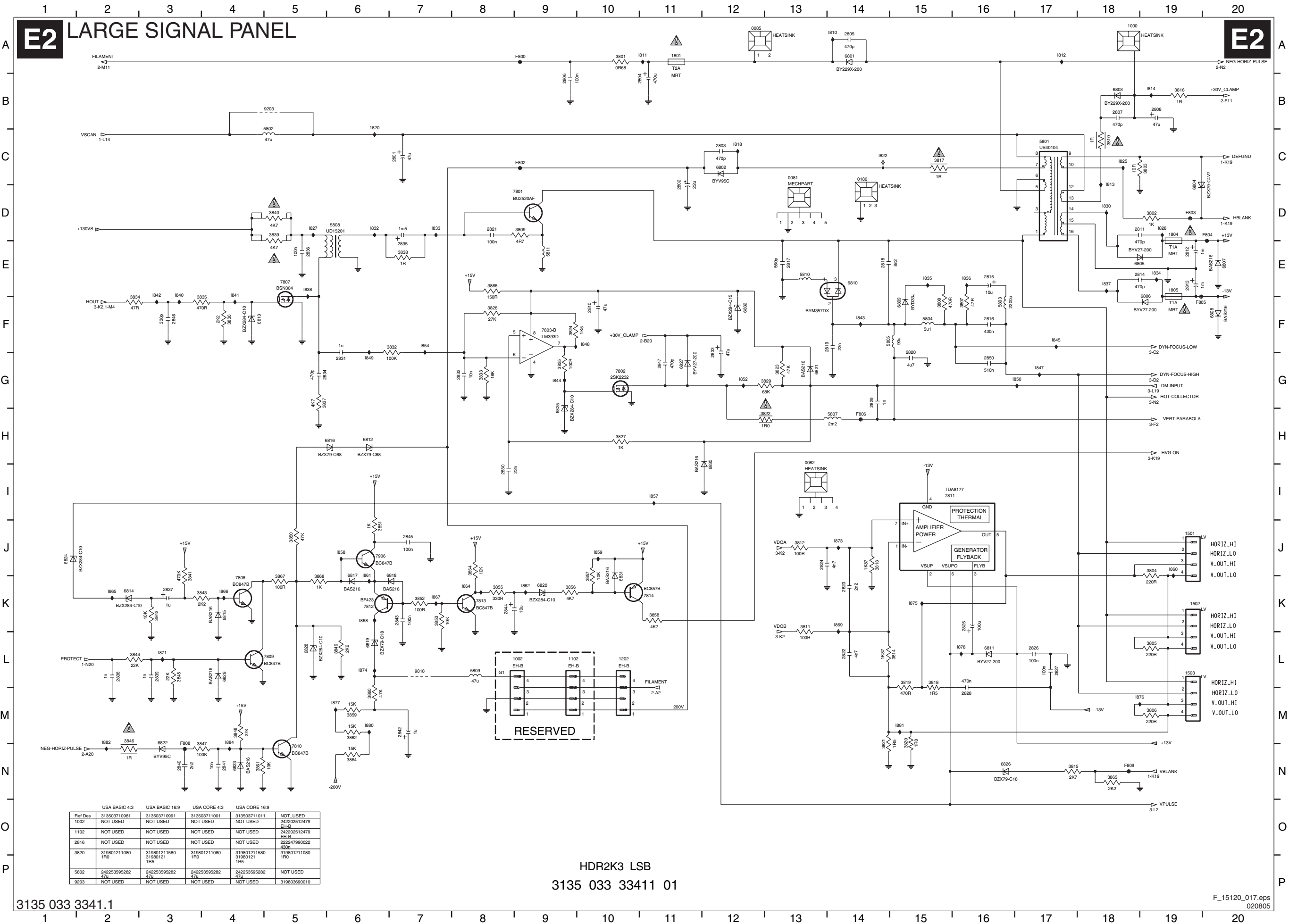
Layout CRT Panel (Bottom Side)



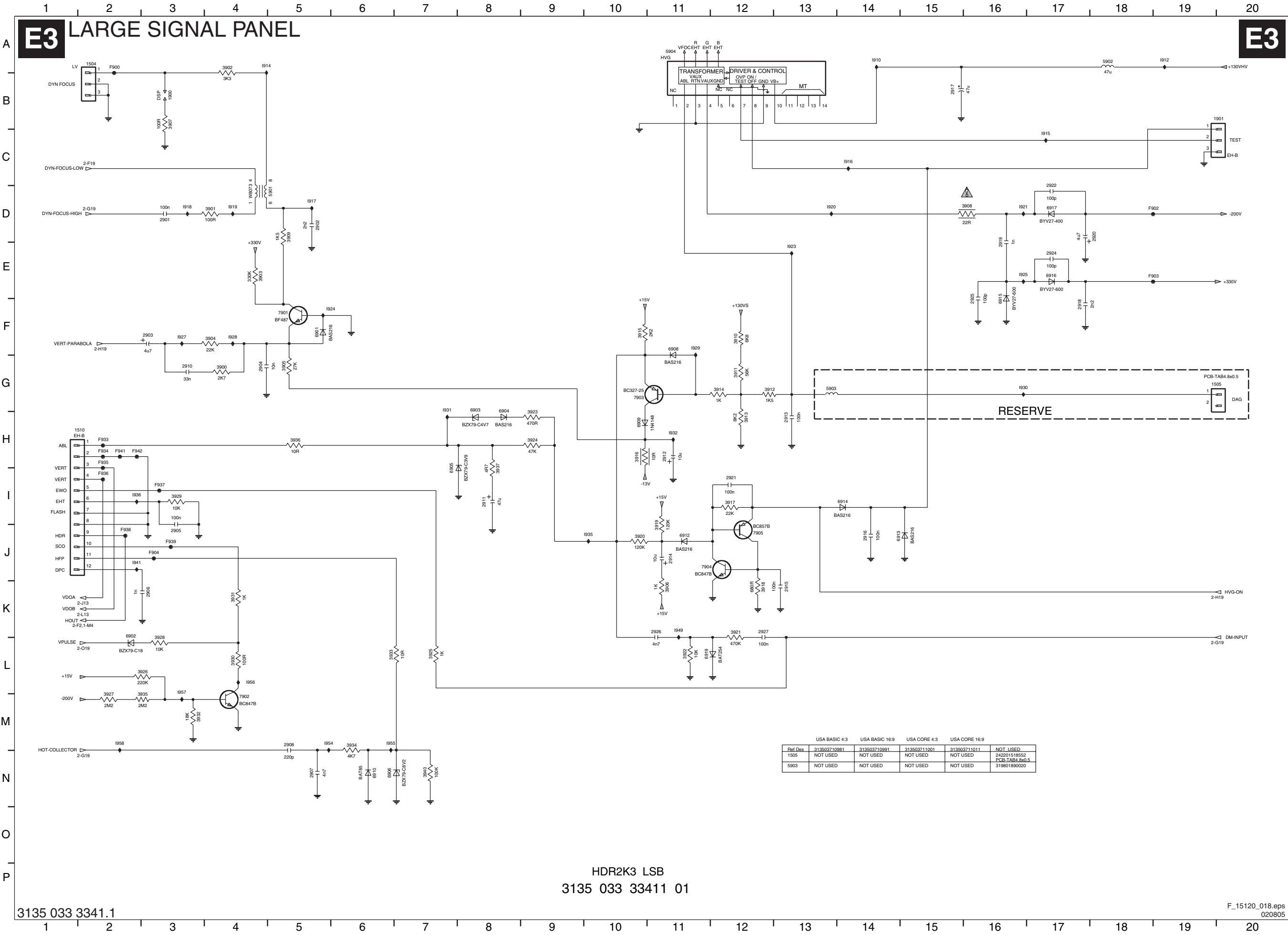
Large Signal Panel



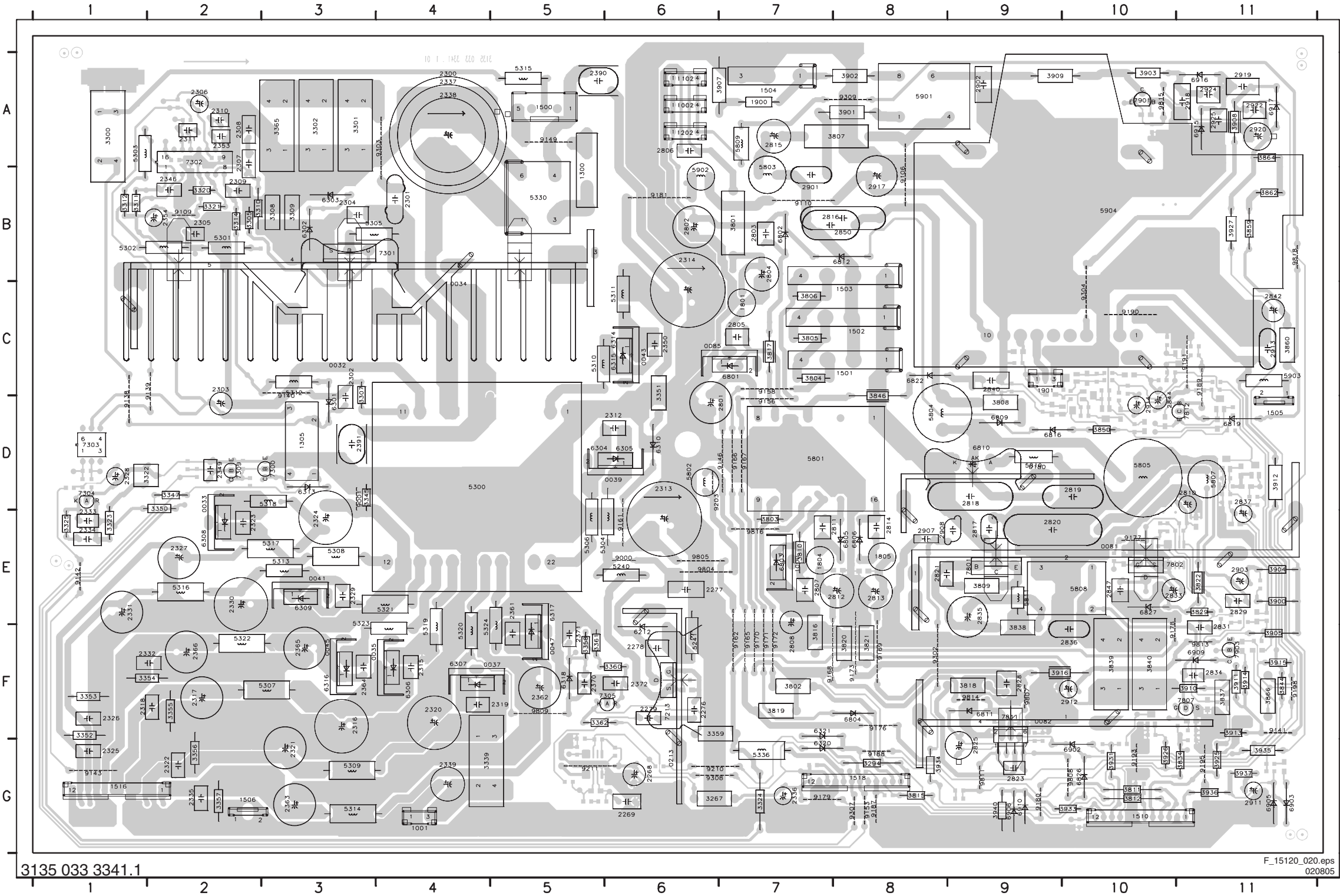
Large Signal Panel



Large Signal Panel

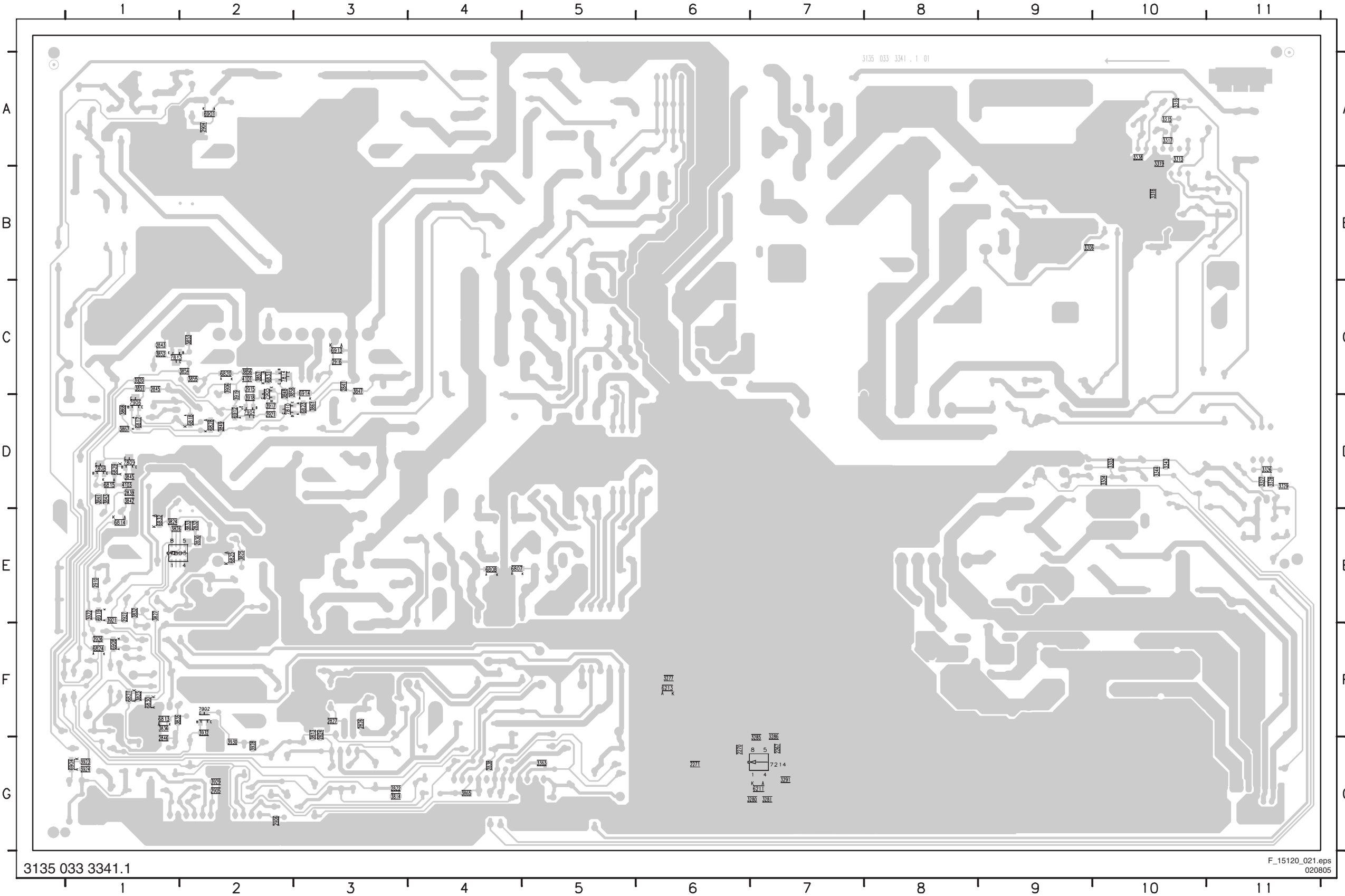


Layout Large Signal Panel (Top Side)



0032 C3	2802 B6	3817 C7	6313 D3	9808 G10
0033 D2	2803 B7	3818 F9	6314 C6	9809 F5
0034 C4	2804 B7	3819 F7	6315 C6	9810 G9
0035 F3	2805 C7	3820 F8	6316 F3	9811 G9
0037 F5	2806 A5	3821 F8	6317 F5	9812 F8
0039 D6	2807 E7	3822 E11	6318 F5	9813 F11
0041 E3	2808 F7	3823 E11	6320 G7	9814 F9
0043 C6	2810 D11	3834 G11	6321 F7	9815 A10
0045 F3	2811 E8	3837 F11	6801 C7	9816 E7
0047 F5	2812 E8	3838 F9	6802 B7	9818 B11
0081 F10	2813 E8	3839 F10	6803 E7	
0082 F9	2814 E8	3840 F10	6804 F8	
0085 C6	2815 A7	3844 F11	6805 E8	
0180 D9	2816 B7	3846 D8	6806 E8	
0213 G6	2817 E9	3850 D10	6809 D9	
1000 E7	2818 D9	3859 B11	6810 D9	
1001 G4	2819 D10	3860 C11	6811 F9	
1002 A6	2820 E9	3862 B11	6812 B8	
1102 A6	2821 E8	3864 A11	6816 D9	
1202 A6	2823 G9	3866 F11	6819 D11	
1300 B5	2825 G9	3900 E11	6822 C8	
1305 D3	2828 F9	3901 A8	6826 G10	
1500 A5	2829 E11	3902 A8	6827 E10	
1501 C8	2831 F11	3903 A10	6902 G10	
1502 C8	2833 E10	3904 E11	6903 G11	
1503 C8	2834 F11	3905 F11	6909 F11	
1504 A7	2835 E9	3907 A7	6906 G9	
1505 D11	2836 F10	3908 A11	6909 F11	
1506 G2	2837 D11	3909 A9	6910 G9	
1510 G10	2840 C9	3910 F11	6915 A11	
1516 G1	2842 C11	3911 F11	6916 A11	
1518 C8	2844 D10	3912 D11	6917 A11	
1801 F7	2847 F10	3913 F10	7213 F6	
1804 E7	2850 B8	3914 F11	7300 D3	
1805 E8	2901 B7	3915 F11	7301 B4	
1900 A7	2902 A9	3916 F9	7302 A2	
1901 C9	2903 E11	3925 G11	7303 D1	
2268 G6	2907 E8	3926 G10	7304 D1	
2269 G6	2908 E8	3927 E11	7305 F10	
2276 F6	2911 G11	3928 G10	7309 D2	
2277 E6	2912 F10	3933 G10	7801 E9	
2278 F6	2913 C11	3934 G8	7802 E10	
2279 F6	2914 D10	3935 G11	7807 F11	
2300 A4	2917 B8	3936 G11	7811 F9	
2301 B4	2918 A11	3937 G11	7812 D11	
2302 C3	2919 A11	3940 G9	7901 A11	
2303 C3	2920 A11	5240 E6	7903 F11	
2304 B3	2922 A11	5241 F6	9000 E6	
2305 B2	2924 A11	5300 D4	9001 D3	
2306 A2	2925 A11	5301 B2	9106 B8	
2307 A2	3267 G6	5302 B1	9109 B7	
2308 A2	3294 G8	5303 A1	9110 B7	
2309 B2	3300 A1	5304 C5	9138 A1	
2310 A1	3301 A3	5305 B3	9139 C2	
2311 A2	3302 A3	5306 E5	9140 D3	
2312 D6	3305 B2	5307 F3	9141 F11	
2313 D6	3307 C3	5308 E3	9142 E1	
2314 B6	3308 B3	5309 G3	9143 G1	
2315 F4	3309 B3	5310 C5	9146 D7	
2316 F4	3310 B2	5311 C6	9149 A6	
2317 F2	3311 G11	5312 C3	9153 C8	
2318 F1	3312 B1	5313 E3	9156 D7	
2319 F5	3314 B2	5314 G3	9158 C7	
2320 F4	3320 B2	5315 A5	9161 E6	
2321 G3	3321 B2	5316 E2	9162 F7	
2322 G2	3322 D1	5317 E3	9165 F7	
2323 E2	3323 E1	5318 D3	9166 D7	
2324 E3	3324 G7	5319 F4	9167 D7	
2325 G1	3325 E1	5320 F4	9168 F7	
2326 F1	3329 G4	5321 E4	9169 F8	
2327 E2	3345 D3	5322 F2	9170 F7	
2328 D1	3347 D2	5323 E3	9171 F7	
2329 E3	3350 D2	5324 F4	9172 F7	
2330 E2	3351 G6	5330 B5	9173 F8	
2331 E1	3352 F1	5336 G7	9176 F8	
2332 F1	3353 F1	5801 F7	9177 E10	
2333 E1	3354 F1	5802 D6	9178 F10	
2334 E1	3355 F2	5803 B7	9179 G7	
2335 G2	3356 G2	5804 D8	9180 G9	
2336 G7	3357 G2	5805 D10	9181 B6	
2337 A4	3358 F5	5807 D11	9187 G8	
2338 A4	3359 F6	5808 E10	9188 C8	
2339 G4	3360 F6	5809 A7	9189 C11	
2346 B2	3361 F5	5810 D9	9190 C10	
2349 D2	3362 F5	5811 E9	9191 C11	
2350 C6	3365 A3	5901 A8	9193 G10	
2353 A2	3801 B7	5902 B6	9195 G11	
2354 B2	3802 F7	5903 C11	9198 F11	
2361 E5	3803 E7	5904 B10	9203 D6	
2362 F5	3804 C7	6212 F6	9210 G6	
2363 G3	3805 C7	6301 D3	9211 F5	
2364 F3	3806 C7	6302 B3	9302 F8	
2365 F3	3807 A8	6303 B3	9303 A4	
2366 F2	3808 D9	6304 D5	9304 C10	
2370 F5	3809 E9	6305 D6	9307 G8	
2371 F5	3810 E7	6306 F4	9308 G6	
2372 F6	3811 G10	6307 F4	9309 A8	
2390 A5	3812 G10	6308 E2	9804 E6	
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2801 D7	3816 F7	6310 D6	9807 F9	

Layout Large Signal Panel (Bottom Side)

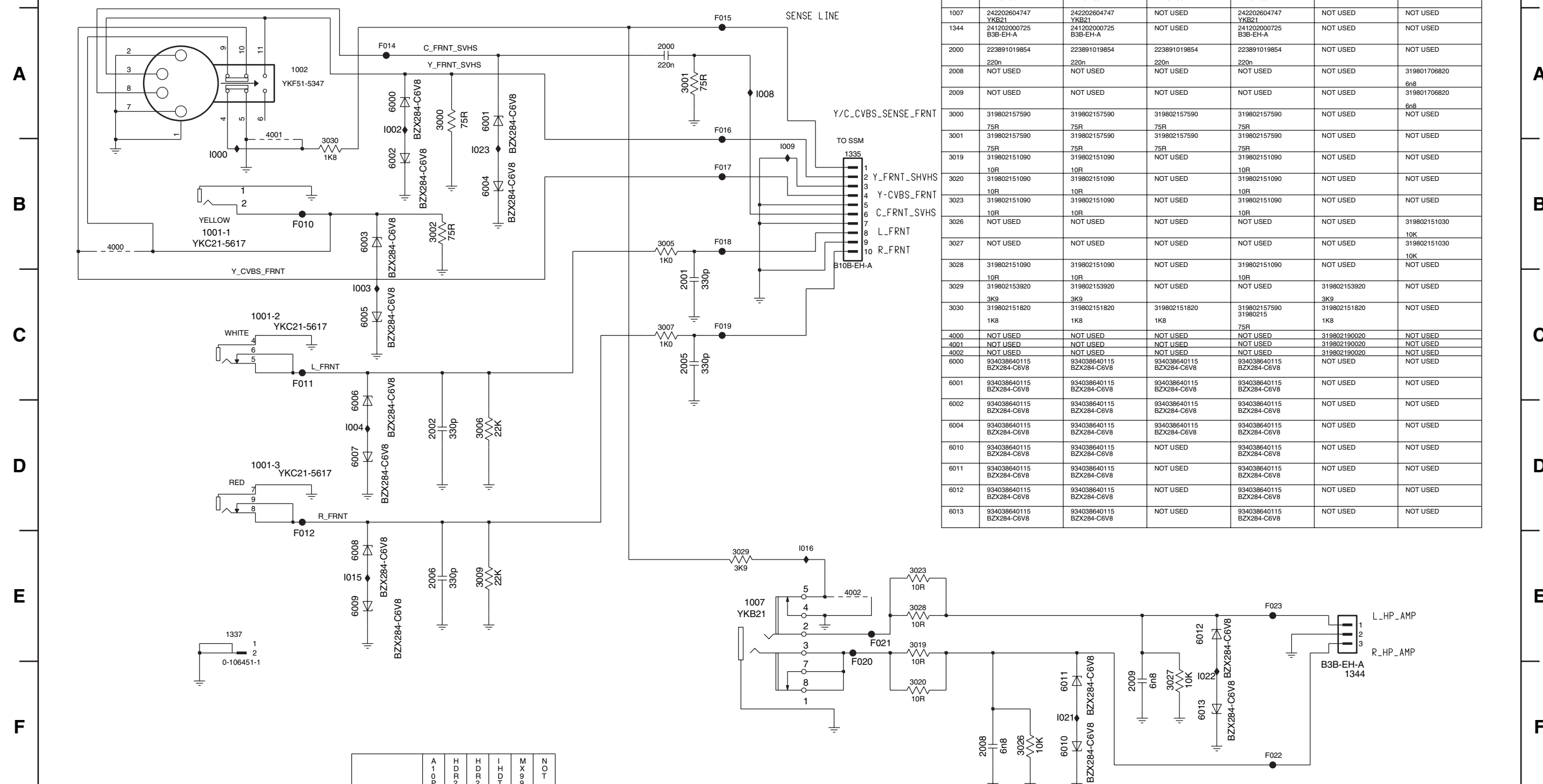


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2270	G6	6820	C2
2271	G6	6821	F1
2822	G3	6823	D3
2824	F3	6824	F1
2826	F3	6825	E2
2827	F3	6828	D2
2830	E2	6829	D1
2832	E2	6830	F1
2838	G4	6831	C2
2839	D1	6832	E1
2841	C3	6901	A2
2843	C1	6904	G1
2845	C1	6908	F1
2846	G1	6912	D2
2904	A2	6913	C3
2905	G2	6914	C3
2906	G2	6919	E1
2910	E1	7214	G7
2915	C2	7803	E1
2916	C3	7808	D1
2921	D2	7809	D1
2926	F1	7810	D2
2927	E1	7813	C1
3277	F6	7814	C2
3280	G7	7902	F2
3281	G7	7904	D2
3285	G7	7905	C2
3286	F7	7906	D1
3291	G7		
3303	D10		
3304	D10		
3306	B9		
3313	A10		
3315	A10		
3316	A10		
3317	A10		
3318	B10		
3319	A10		
3326	D11		
3327	D11		
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3338	A10		
3343	D10		
3344	D10		
3363	G5		
3813	F3		
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3867	D1		
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3917	D2		
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3920	C1		
3921	E1		
3922	E1		
3923	C1		
3924	G1		
3928	G2		
3929	G2		
3930	G2		
3932	F2		
4101	C2		
4103	D1		
6211	G7		
6213	F6		
6807	E4		
6808	E4		
6813	F1		
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6815	D1		
6817	D1		

3135 033 3341.1

F_15120_021.eps
020805

G1 Side Jack Panel



Ref	Def	3135_037_05461	3135_037_10581	3135_037_11961	3135_037_12131	3135_037_12321	RESERVED
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1007	242202604747 YKB21	242202604747 YKB21	NOT USED	242202604747 YKB21	NOT USED	NOT USED	NOT USED
1344	241202000725 B3B-EH-A	241202000725 B3B-EH-A	NOT USED	241202000725 B3B-EH-A	NOT USED	NOT USED	NOT USED
2000	223891019854 220n	223891019854 220n	223891019854 220n	223891019854 220n	NOT USED	NOT USED	NOT USED
2008	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	319801706820 6n8
2009	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	319801706820 6n8
3000	319802157590 75R	319802157590 75R	319802157590 75R	319802157590 75R	NOT USED	NOT USED	NOT USED
3001	319802157590 75R	319802157590 75R	319802157590 75R	319802157590 75R	NOT USED	NOT USED	NOT USED
3019	319802151090 10R	319802151090 10R	NOT USED	319802151090 10R	NOT USED	NOT USED	NOT USED
3020	319802151090 10R	319802151090 10R	NOT USED	319802151090 10R	NOT USED	NOT USED	NOT USED
3023	319802151090 10R	319802151090 10R	NOT USED	319802151090 10R	NOT USED	NOT USED	NOT USED
3026	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	319802151030 10K
3027	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	319802151030 10K
3028	319802151090 10R	319802151090 10R	NOT USED	319802151090 10R	NOT USED	NOT USED	NOT USED
3029	319802153920 3K9	319802153920 3K9	NOT USED	NOT USED	319802153920 3K9	NOT USED	NOT USED
3030	319802151820 1K8	319802151820 1K8	319802151820 1K8	319802157590 31980215 75R	319802151820 1K8	NOT USED	NOT USED
4000	NOT USED	NOT USED	NOT USED	NOT USED	319802190020	NOT USED	NOT USED
4001	NOT USED	NOT USED	NOT USED	NOT USED	319802190020	NOT USED	NOT USED
4002	NOT USED	NOT USED	NOT USED	NOT USED	319802190020	NOT USED	NOT USED
6000	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6001	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6002	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6004	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6010	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6011	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6012	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED
6013	934038640115 BXZ284-C6V8	934038640115 BXZ284-C6V8	NOT USED	934038640115 BXZ284-C6V8	NOT USED	NOT USED	NOT USED

- NOTES
1. CAPACITANCE VALUES ARE IN FARADS:
m=MILI u=MICRO n=NANO p=PICO f=FEMTO
 2. RESISTANCE VALUES ARE IN OHMS:
R=OHM K=KILO M=MEGA G=GIGA T=TERA
 3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT
 4. FOR VALUE SEE TABLE.

	A 1 O P T V	H D R 2 K 2	H D R 2 K 3 E M G	I H D T V 2 K 4	M X 9 9 9	N O T U S E D
3135_037_05461	X					
3135_037_10581		X				
3135_037_11961				X		
3135_037_12131			X			
3135_037_12221					X	
RESERVED						X

1001-1 B2
1001-2 C2
1001-3 D2
1002 A2
1007 E6
1335 B7
1337 E2
1344 F10
2000 A5
2001 C5
2002 D3
2005 C5
2006 E3
2008 F8
2009 F9
3000 A3
3001 A5
3002 B3
3005 B5
3006 D4
3007 C5
3009 E4
3019 E7
3020 F7
3023 E7
3026 F8
3027 F9
3028 E7
3029 E6
3030 B3
4000 B1
4001 A2
4002 E7
6000 A3
6001 A4
6002 B3
6003 B3
6004 B4
6005 C3
6006 D3
6007 D3
6008 E3
6009 E3
6010 F8
6011 F8
6012 E9
6013 F9
F010 B2
F011 C2
F012 E2
F014 A3
F015 A6
F016 A6
F017 B6
F018 B6
F019 C6
F020 F7
F021 E7
F022 F10
F023 E10
1000 B2
1002 A3
1003 C3
1004 D3
1008 A6
1009 B6
1015 E3
1016 E6
1021 F8
1022 F9
1023 B4

G2 A10PTV SIDE JACK PANEL

REFDES	SH-ZONE	REFDES	SH-ZONE
1001-A	1-C3	I003	1-D4
1001-B	1-D3	I004	1-E3
1001-C	1-F3	I008	1-B7
1002-A	1-B1	I009	1-B7
1002-B	1-A2	I015	1-G3
1007	1-G7	I016	1-F7
1335	1-C8	I021	1-H10
1337	1-H1	I022	1-G11
1344	1-G12	I023	1-B5
2000	1-A6		
2001	1-D6		
2002	1-E4		
2005	1-D6		
2006	1-G4		
2008	1-H9		
2009	1-H10		
3000	1-B4		
3001	1-B6		
3002	1-C4		
3005	1-C6		
3006	1-E5		
3007	1-D6		
3009	1-C5		
3019	1-G8		
3020	1-H8		
3023	1-G8		
3026	1-H9		
3027	1-H11		
3028	1-G8		
3029	1-F7		
3030	1-B3		
4000	1-A2		
4001	1-B3		
4002	1-G8		
6000	1-B4		
6001	1-B5		
6002	1-B4		
6003	1-C4		
6004	1-C5		
6005	1-D4		
6006	1-E3		
6007	1-F3		
6008	1-F3		
6009	1-G3		
6010	1-H10		
6011	1-H10		
6012	1-G11		
6013	1-H11		

REFDES	SH-ZONE
F010	1-C3
F011	1-E3
F012	1-F3
F014	1-A4
F015	1-A7
F016	1-B7
F017	1-C7
F018	1-C7
F019	1-D7
F020	1-G8
F021	1-G8
F022	1-H12
F023	1-G12

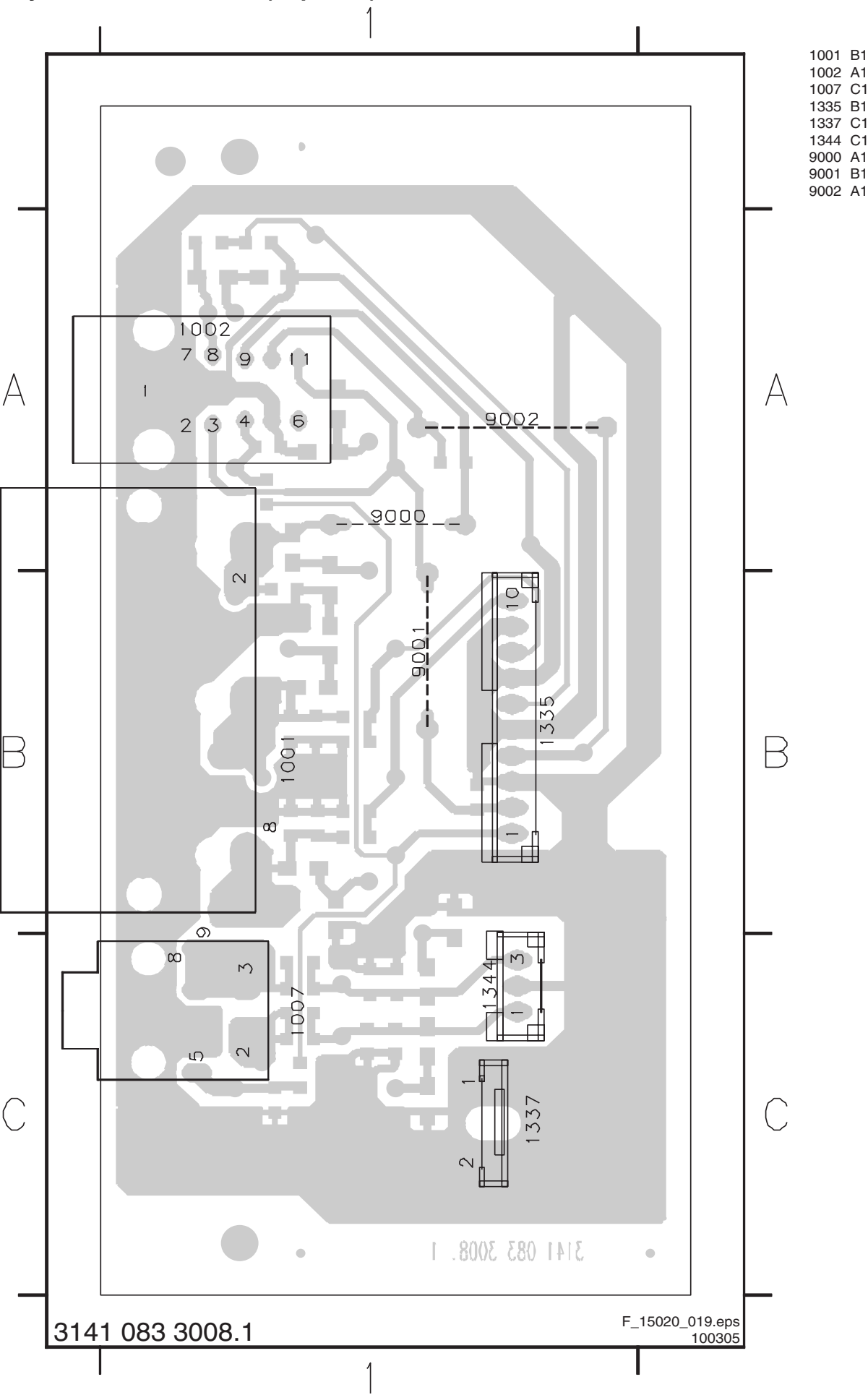
REFDES	SH-ZONE
I000	1-B2
I002	1-B4

3135 033 3217.4

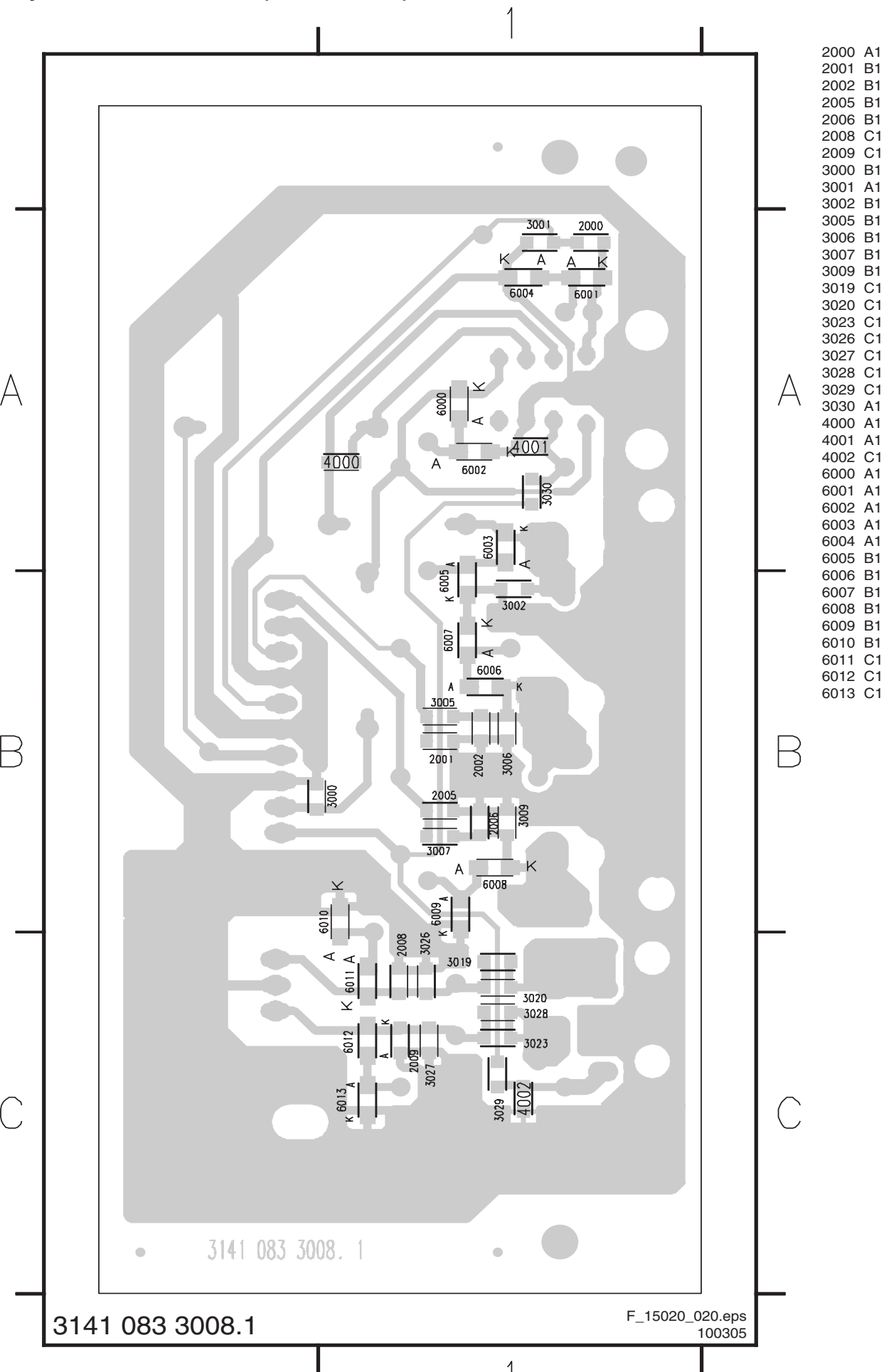
E_15000_033.eps
191004

[illegible]

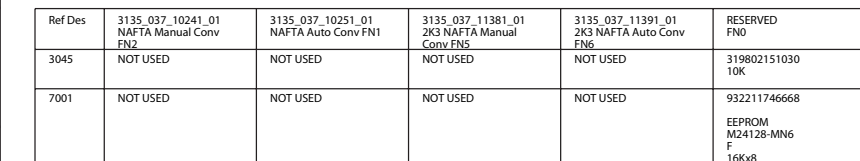
Layout Side Jack Panel (Top Side)



Layout Side Jack Panel (Bottom Side)



H1 ACS MODULE



NOTES

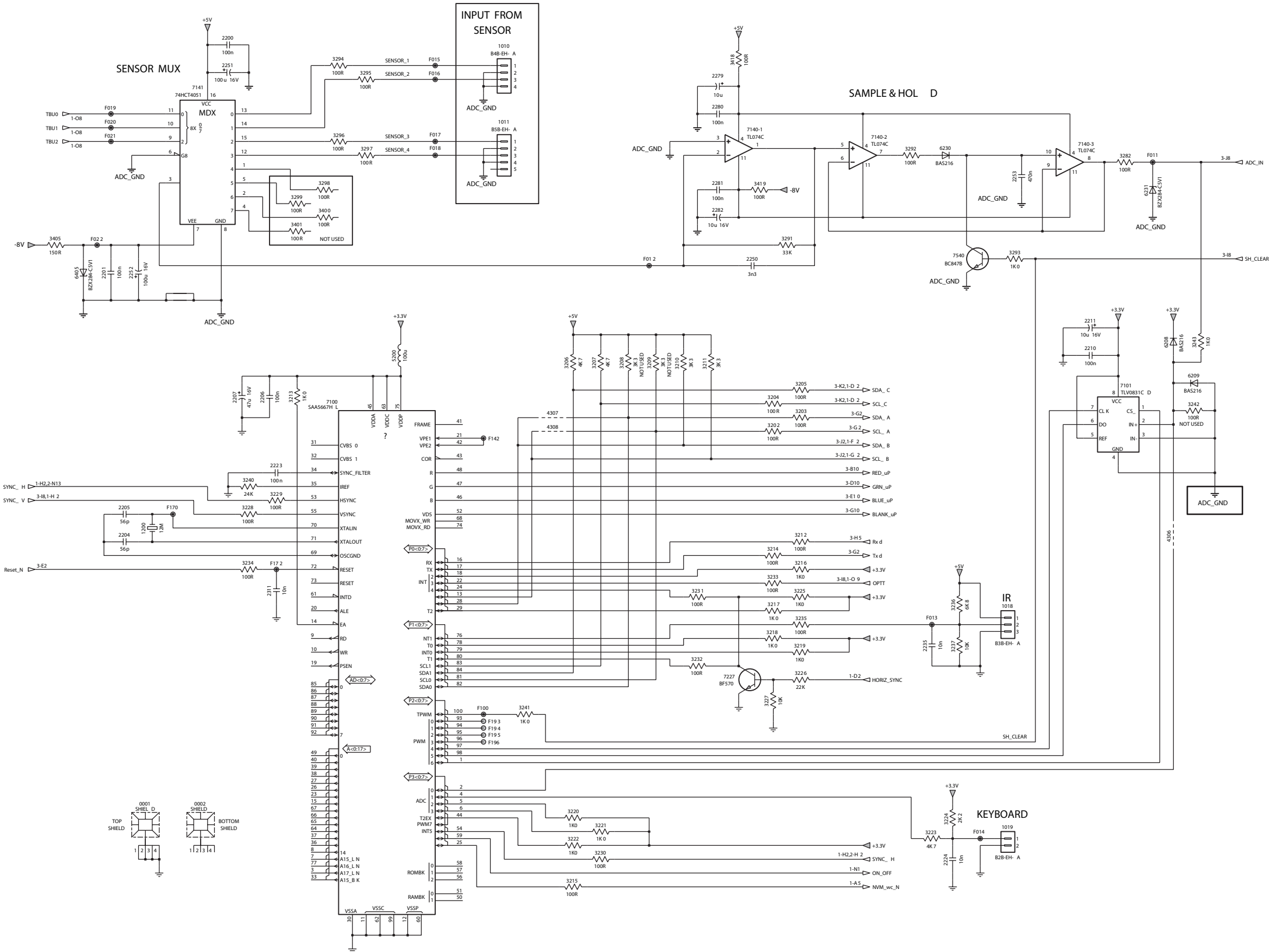
1. CAPACITANCE VALUES ARE IN FARADS:
m=MILLI u=MICRO n=NANO p=PICO f=FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
R=OHM K=KILO M=MEGA G=GIGA T=TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. ~~FOR~~ OR VALUE SEE TABLE.

AUTO CONVERGENCE

ACS Module

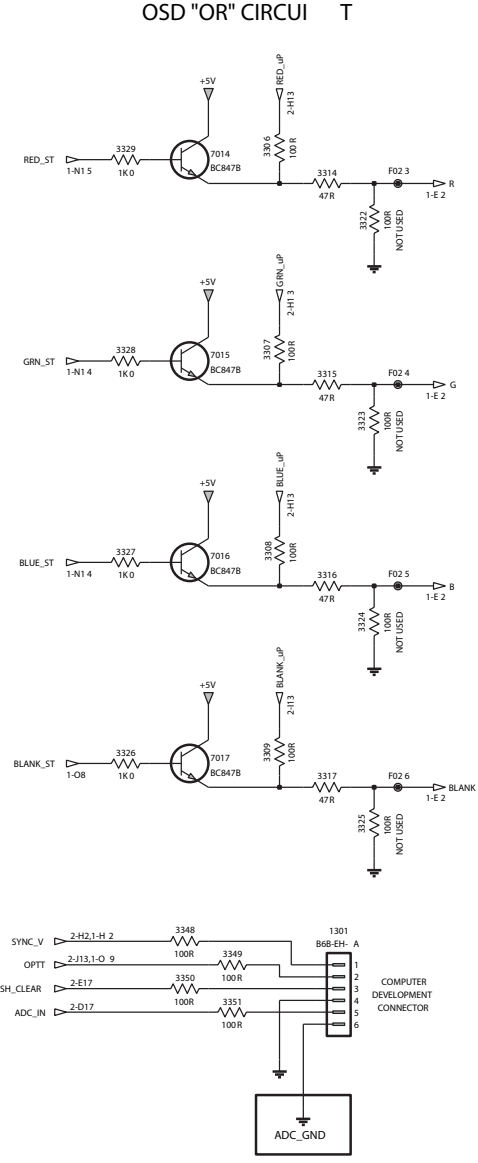
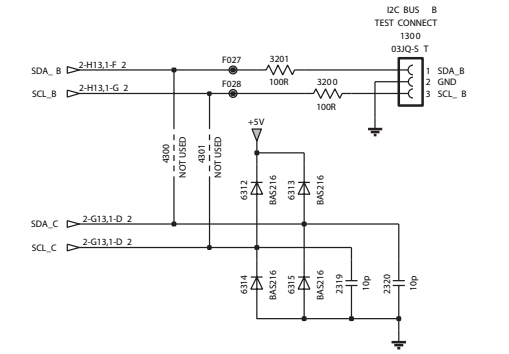
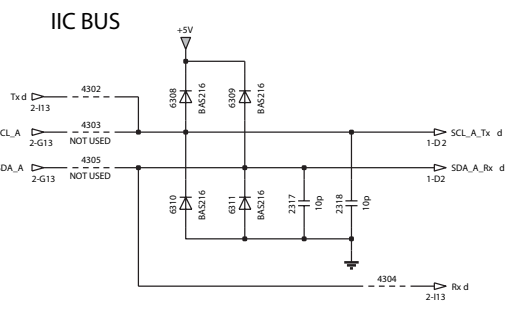
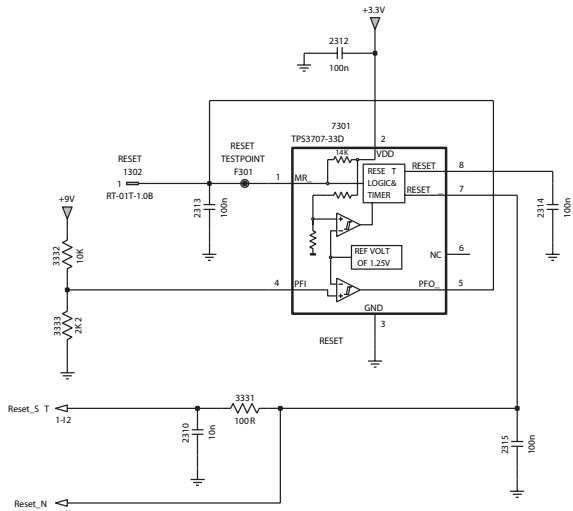
H2 ACS MODULE

H2



ACS Module

H3 ACS MODULE



SHEET 3

Ref Des	3135_037_10241_01 NAFTA Manual Conv FNS	3135_037_10251_01 NAFTA Auto Conv FNS	3135_037_11381_01 2K3 NAFTA Manual Conv FNS	3135_037_11391_01 2K3 NAFTA Auto Conv FNS	RESERVED FNS
3322	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3323	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3324	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3325	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
4300	NOT USED	NOT USED	NOT USED	NOT USED	319802190020
4301	NOT USED	NOT USED	NOT USED	NOT USED	319802190020
4303	NOT USED	NOT USED	NOT USED	NOT USED	319802190020
4305	NOT USED	NOT USED	NOT USED	NOT USED	319802190020

SHEET 2

Ref Des	3135_037_10241_01 NAFTA Manual Conv FNS	3135_037_10251_01 NAFTA Auto Conv FNS	3135_037_11381_01 2K3 NAFTA Manual Conv FNS	3135_037_11391_01 2K3 NAFTA Auto Conv FNS	RESERVED FNS
1010	NOT USED	242202512479 B6B-EH_A	NOT USED	242202512479 B6B-EH_A	NOT USED
1011	NOT USED	242202512481 B6B-EH_A	NOT USED	242202512481 B6B-EH_A	NOT USED
2200	NOT USED	319802321040 100n	NOT USED	319802321040 100n	NOT USED
2201	NOT USED	319802321040 100n	NOT USED	319802321040 100n	NOT USED
2210	NOT USED	319802321040 100n	NOT USED	319802321040 100n	NOT USED
2211	NOT USED	319803041090 10u 16V	NOT USED	319803041090 10u 16V	NOT USED
2250	NOT USED	319801703320 3n3	NOT USED	319801703320 3n3	NOT USED
2251	NOT USED	319803041010 100u 16V	NOT USED	319803041010 100u 16V	NOT USED
2252	NOT USED	319803041010 100u 16V	NOT USED	319803041010 100u 16V	NOT USED
2253	NOT USED	319801724740 420n	NOT USED	319801724740 420n	NOT USED
2279	NOT USED	319803041090 10u	NOT USED	319803041090 10u	NOT USED
2280	NOT USED	319802321040 100n	NOT USED	319802321040 100n	NOT USED
2281	NOT USED	319802321040 100n	NOT USED	319802321040 100n	NOT USED
2282	NOT USED	319803041090 10u 16V	NOT USED	319803041090 10u 16V	NOT USED
3208	NOT USED	NOT USED	NOT USED	NOT USED	319802153320 3K3
3209	NOT USED	NOT USED	NOT USED	NOT USED	319802153320 3K3
3241	NOT USED	319802151020 1K0	NOT USED	319802151020 1K0	NOT USED
3242	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3243	NOT USED	319802151020 1K0	NOT USED	319802151020 1K0	NOT USED
3282	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3291	NOT USED	319802153330 33K	NOT USED	319802153330 33K	NOT USED
3292	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3293	NOT USED	319802151020 1K0	NOT USED	319802151020 1K0	NOT USED
3294	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3295	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3296	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3297	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3298	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3299	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3400	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3401	NOT USED	NOT USED	NOT USED	NOT USED	319802151010 100R
3405	NOT USED	319802151510 150R	NOT USED	319802151510 150R	NOT USED
3418	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
3419	NOT USED	319802151010 100R	NOT USED	319802151010 100R	NOT USED
6208	NOT USED	934025530115 BAS216	NOT USED	934025530115 BAS216	NOT USED
6209	NOT USED	934025530115 BAS216	NOT USED	934025530115 BAS216	NOT USED
6230	NOT USED	934025530115 BAS216	NOT USED	934025530115 BAS216	NOT USED
6231	NOT USED	934038610115 RZY284-CSV_1	NOT USED	934038610115 RZY284-CSV_1	NOT USED
6405	NOT USED	934038610115 RZY284-CSV_1	NOT USED	934038610115 RZY284-CSV_1	NOT USED
7101	NOT USED	932217307668 TLV0831C_D	NOT USED	932217307668 TLV0831C_D	NOT USED
7140-1	NOT USED	932201584668 TL074C	NOT USED	932201584668 TL074C	NOT USED
7140-2	NOT USED	932201584668 TL074C	NOT USED	932201584668 TL074C	NOT USED
7140-3	NOT USED	932201584668 TL074C	NOT USED	932201584668 TL074C	NOT USED
7141	NOT USED	932715300118 TL074C	NOT USED	932715300118 TL074C	NOT USED
7540	NOT USED	74NCT4051 MIX	NOT USED	74NCT4051 MIX	NOT USED

2K3 NAFTA Auto	2K3 NAFTA Auto	NAFTA Auto	NAFTA Auto	NOT USED
3135_037_10241_01			X	
3135_037_10251_01		X		
3135_037_11381_01	X			
3135_037_11391_01	X			
RESERVED				X

AUTO CONVERGENCE
3135 013 32338

3135 013 3233.8

F_15120_024.eps
020805

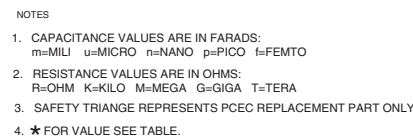
H4 ACS MODULE: MAPPING

F_15120_025.eps
020805

0001	A3	2053	B4
1000	C3	2054	B4
1001	C1	2055	B3
1002	B1	2056	B4
1003	B1	2057	C4
1004	B4	2058	B4
1005	B3	2059	B4
1010	B4	2200	A4
1011	A4	2201	A4
1018	A3	2206	A3
1019	A2	2207	A3
1200	A3	2210	A3
1300	A4	2211	A2
1301	C2	2235	A3
1302	C4	2251	A4
2001	C1	2252	A4
2003	C1	2279	A1
2004	C1	2280	A1
2006	C1	2281	A1
2007	A1	2282	A1
2008	A1	2310	C4
2009	B2	2312	B4
2011	C2	2313	B4
2012	B2	2314	B4
2013	B2	2315	C4
2014	B2	3021	B2
2015	C2	3034	B3
2027	B3	3045	B2
2028	C2	3048	B3
2029	C2	3049	B3
2030	B3	3053	C3
2031	B3	3054	C3
2032	B3	3063	B3
2033	B3	3064	B3
2034	B2	3068	B3
2035	B2	3069	B3
2040	B2	3070	B3
2041	C2	3073	B3
2046	B3	3074	B3
2047	B3	3075	B3
2048	B4	3084	B4
2049	B4	3090	C4
2050	B4	3091	C4
2051	B4	3092	C4
2052	B4	3218	A3

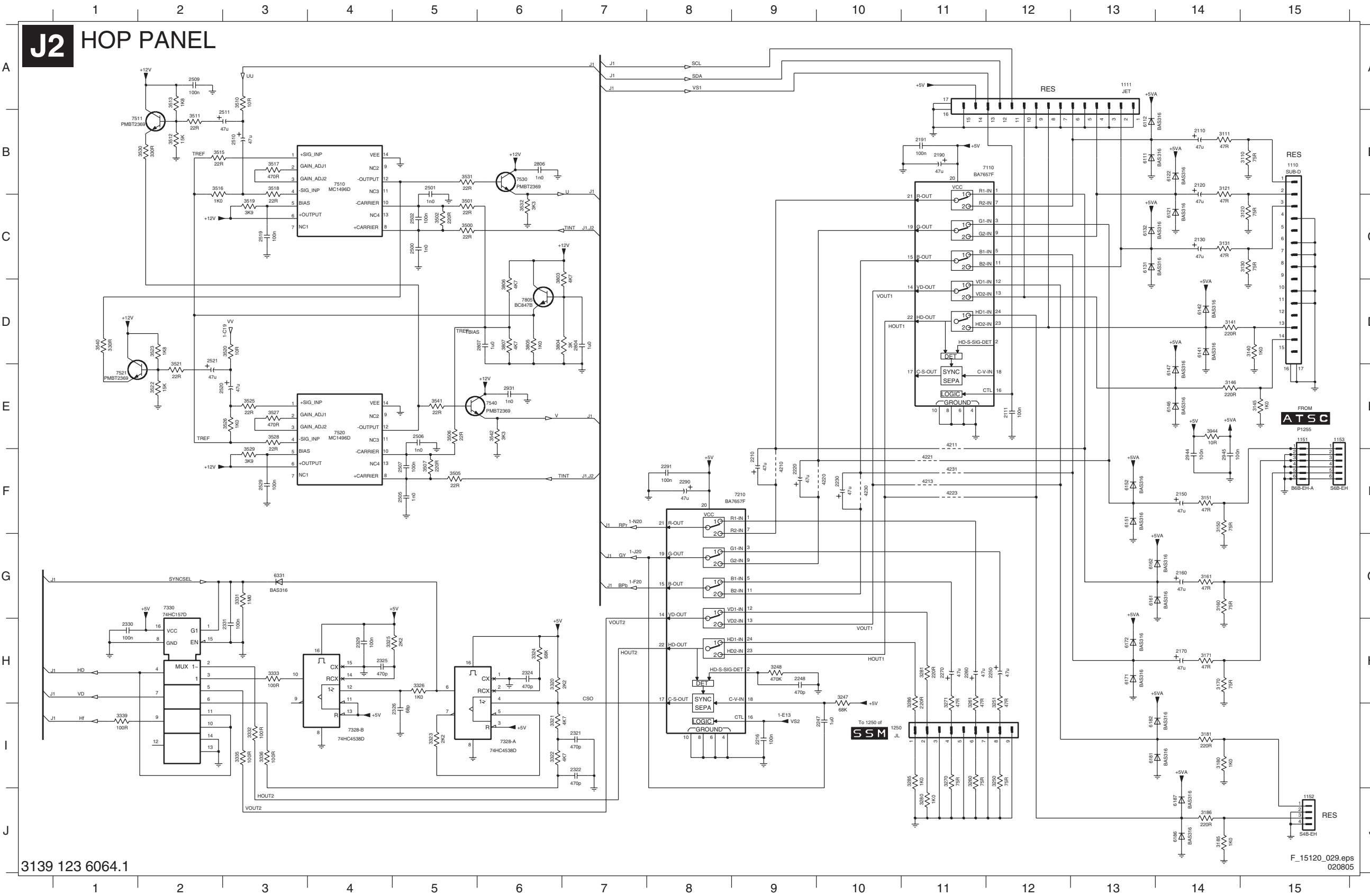
2002	B3	3029	C4	3205	B2	3317	C1	7022	B4
2005	B4	3030	C4	3206	B2	3322	C2	7023	B4
2010	B3	3031	C4	3207	B2	3323	C2	7024	B4
2016	B3	3032	C3	3208	B2	3324	C1	7025	C3
2017	B3	3033	C3	3209	B2	3325	C1	7026	C4
2018	B3	3035	B3	3210	A1	3326	C1	7027	C4
2019	C3	3036	B3	3211	A1	3327	C2	7028	C3
2020	C3	3040	B3	3212	B3	3328	C1	7029	B3
2021	C4	3041	A3	3213	A2	3329	C2	7030	B1
2022	C3	3042	B3	3214	B3	3348	C3	7031	B1
2023	C3	3043	B3	3215	A3	3349	C3	7032	B1
2024	C4	3044	B3	3216	B2	3350	C3	7033	B2
2025	C3	3050	B2	3217	B2	3351	C3	7034	B1
2026	C3	3051	B2	3220	B2	3400	A1	7035	C1
2042	B2	3052	B1	3221	B2	3401	A1	7036	C4
2043	C2	3055	C2	3222	B2	3405	A1	7037	C4
2044	B2	3056	C1	3223	A3	4000	B3	7038	B3
2045	B2	3057	C1	3224	A3	4001	B4	7227	A3
2204	A2	3058	B3	3225	A3	4300	C2	7540	A3
2205	A2	3059	B2	3226	A3	4301	C2		
2223	B1	3060	B1	3227	A3	4302	C2		
2224	A3	3061	B1	3228	A2	4303	C2		
2250	A3	3062	B1	3229	A2	4304	C3		
2253	A3	3065	B2	3230	A2	4305	C2		
2311	A2	3066	B2	3231	A2	4307	A1		
2317	C2	3067	B1	3232	A2	4308	B2		
2318	C2	3071	B1	3233	B3	6000	B4		
2319	C2	3072	B1	3234	A1	6006	C4		
2320	C2	3076	B1	3240	A1	6209	A3		
3005	C4	3077	B1	3241	A3	6230	A3		
3010	B4	3079	B4	3242	A3	6231	A3		
3011	B4	3080	B4	3243	A3	6308	C2		
3012	B4	3081	C4	3282	A3	6309	C2		
3013	B4	3082	C3	3291	A3	6310	C2		
3014	B4	3083	C3	3292	A3	6311	C2		
3015	B3	3085	B2	3293	A4	6312	C2		
3016	B3	3086	B1	3298	A1	6313	C2		
3020	B4	3087	B2	3299	A1	6314	C2		
3022	B3	3088	B1	3306	C2	6315	C2		
3023	C3	3089	B2	3307	C1	7014	C2		
3024	C4	3200	A1	3308	C1	7015	C1		
3025	C4	3201	A1	3309	C1	7016	C1		
3026	C4	3202	B2	3314	C2	7017	C1		
3027	C4	3203	B3	3315	C2	7020	B4		
3028	C3	3204	B2	3316	C2	7021	B4		

J1 HOP PANEL



HOP Panel

J2 HOP PANEL



3139 123 6064.1

F_15120_029.eps
020805

1110 B15	3528 E3
1111 A13	3529 F3
1151 E15	3530 B2
1152 J15	3531 B5
1153 E15	3532 C6
1250 I10	3540 D1
2110 B14	3541 E5
2111 E12	3542 E6
2120 B14	3803 C6
2130 C14	3804 D6
2150 F14	3805 D6
2160 G14	3806 D6
2170 H14	3807 D6
2190 B11	3944 E14
2191 B11	4210 F9
2210 F9	4211 E11
2216 I9	4213 F11
2220 F9	4220 F10
2230 F10	4221 F11
2248 H9	4230 F10
2250 H12	4231 F11
2260 H11	6111 B13
2270 H11	6112 B13
2290 F8	6121 C14
2291 F8	6122 B14
2321 I7	6131 C13
2322 I7	6132 C13
2324 H6	6141 D14
2325 H4	6142 D14
2326 I5	6146 E15
2329 H4	6147 E14
2330 H1	6151 F13
2331 H3	6152 F13
2500 C5	6161 G13
2501 B5	6162 G13
2502 C5	6171 H13
2505 F5	6172 H13
2506 E5	6181 I13
2507 F5	6182 I13
2509 A2	6186 J14
2510 B3	6187 J14
2511 B3	6331 G3
2519 C3	7110 B12
2520 E3	7210 F9
2521 D2	7328-A I6
2529 F3	7328-B I4
2804 D7	7330 G2
2806 B6	7510 B4
2807 D6	7511 B1
2931 E6	7520 E4
2944 F14	7521 E1
2945 F14	7530 B6
3110 B15	7540 E6
3111 B14	7805 D6
3120 C15	
3121 B14	
3130 C15	
3131 C14	
3140 D15	
3141 D14	
3145 E15	
3146 E14	
3150 F14	
3151 F14	
3160 G14	
3161 G14	
3170 H14	
3171 H14	
3180 I14	
3181 I14	
3185 J14	
3186 J14	
3247 H10	
3248 H9	
3250 I12	
3251 H12	
3260 I11	
3261 H11	
3270 I11	
3280 J11	
3281 H11	
3285 I11	
3286 H11	
3320 H6	
3321 I6	
3322 I6	
3323 I5	
3324 H6	
3325 H4	
3326 H5	
3331 G3	
3332 I3	
3333 H3	
3335 I3	
3336 I3	
3339 I1	
3500 C5	
3501 C5	
3502 C5	
3505 F5	
3506 E5	
3507 F5	
3510 A3	
3511 B2	
3512 B2	
3513 A2	
3515 B2	
3516 B2	
3517 B3	
3518 B3	
3519 C3	
3520 D3	
3521 E2	
3522 E2	
3523 D2	
3525 E3	
3526 E3	
3527 E3	

1	2	3	4	5	6	7
J3 HDR2K4 HOP 28KHZ AP AUG						
N3 HOP DB15			N3 HOP W/O DB15		RESERVED	
Ref Des	3135_037_12781_01	3135_037_12791_01	RESERVED			
1030	NOT USED	NOT USED	242202517535 JQ-S			
2603	NOT USED	NOT USED	NOT USED			
2604	NOT USED	NOT USED	NOT USED			
2605	NOT USED	NOT USED	NOT USED			
2608	NOT USED	NOT USED	NOT USED			
2900	NOT USED	NOT USED	319801721050			
3611	NOT USED	NOT USED	1u0			
3613	319802152220 2K2	319802152220 2K2	NOT USED			
3617	NOT USED	NOT USED	NOT USED			
3618	NOT USED	NOT USED	NOT USED			
3619	NOT USED	NOT USED	NOT USED			
3620	NOT USED	NOT USED	NOT USED			
3621	NOT USED	NOT USED	NOT USED			
3625	NOT USED	NOT USED	NOT USED			
3629	NOT USED	NOT USED	NOT USED			
3616	NOT USED	NOT USED	319802151030 10K			
3817	NOT USED	NOT USED	319802151040 100K			
3818	NOT USED	NOT USED	319802151040 100K			
3826	NOT USED	NOT USED	319802151030 10K			
4957	NOT USED	NOT USED	319802190020			
7601	NOT USED	NOT USED	NOT USED			
7602	NOT USED	NOT USED	NOT USED			
7605-1	NOT USED	NOT USED	NOT USED			
7605-2	NOT USED	NOT USED	NOT USED			
SHEET 1						
J3 HDR2K4 HOP 28KHZ AP AUG						
N3 HOP DB15			N3 HOP W/O DB15		RESERVED	
Ref Des	3135_037_12781_01	3135_037_12791_01	RESERVED			
1110	242202516857 SUB-D	NOT USED	NOT USED			
1111	NOT USED	NOT USED	242202517519 JET			
2110	319803044790 47u	NOT USED	NOT USED			
2120	319803044790 47u	NOT USED	NOT USED			
2130	319803044790 47u	NOT USED	NOT USED			
2210	319803044790 47u	NOT USED	NOT USED			
2220	319803044790 47u	NOT USED	NOT USED			
2230	319803044790 47u	NOT USED	NOT USED			
3110	319802157590 75R	NOT USED	NOT USED			
3111	319802154790 47R	NOT USED	NOT USED			
3120	319802157590 75R	NOT USED	NOT USED			
3121	319802154790 47R	NOT USED	NOT USED			
3130	319802157590 75R	NOT USED	NOT USED			
3131	319802154790 47R	NOT USED	NOT USED			
3140	319802151020 10K	NOT USED	NOT USED			
3141	319802152210 220R	NOT USED	NOT USED			
3145	319802151020 10K	NOT USED	NOT USED			
3146	319802152210 220R	NOT USED	NOT USED			
3250	NOT USED	NOT USED	319802157590 75R			
3260	NOT USED	NOT USED	319802157590 75R			
3270	NOT USED	NOT USED	319802157590 75R			
3280	NOT USED	NOT USED	319802151020 10K			
3285	NOT USED	NOT USED	319802151020 10K			
3332	NOT USED	NOT USED	319802151010 100R			
3333	NOT USED	NOT USED	319802151010 100R			
3335	NOT USED	NOT USED	319802151010 100R			
3336	NOT USED	NOT USED	319802151010 100R			
4210	NOT USED	319802190020	NOT USED			
4211	NOT USED	319802190020	NOT USED			
4213	NOT USED	319802190020	NOT USED			
4220	NOT USED	319802190020	NOT USED			
4221	NOT USED	319802190020	NOT USED			
4223	NOT USED	319802190020	NOT USED			
4230	NOT USED	319802190020	NOT USED			
4231	NOT USED	319802190020	NOT USED			
6111	319801010630 BAS316	NOT USED	NOT USED			
6112	319801010630 BAS316	NOT USED	NOT USED			
6121	319801010630 BAS316	NOT USED	NOT USED			
6122	319801010630 BAS316	NOT USED	NOT USED			
6131	319801010630 BAS316	NOT USED	NOT USED			
6132	319801010630 BAS316	NOT USED	NOT USED			
6141	319801010630 BAS316	NOT USED	NOT USED			
6142	319801010630 BAS316	NOT USED	NOT USED			
6146	319801010630 BAS316	NOT USED	NOT USED			
6147	319801010630 BAS316	NOT USED	NOT USED			
6331	NOT USED	NOT USED	319801010630 BAS316			
7110	932211562668 BA7657F	NOT USED	NOT USED			
SHEET 2						
J3 HDR2K4 HOP 28KHZ AP AUG						

3135 033 3429.2

This image shows a full page of blank white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E_06532_012.eps" and "131004".

E_06532_012.eps
131004

Mapping HOP Panel Part 1

J4 HDR2K4 HOP 28KHZ AP AUG

REFDES	SH-ZONE	REFDES	SH-ZONE	REFDES	SH-ZONE	REFDES	SH-ZONE	REFDES	SH-ZONE	REFDES	SH-ZONE	REFDES	SH-ZONE	REFDES	SH-ZONE
1030	1-G10	2472	1-E15	2811	1-F11	3326	2-K6	3495	1-F10	3700	1-E8	4605	1-I3	7710	1-D6
1110	2-B19	2473	1-D14	2812	1-F11	3331	2-K6	3496	1-F11	701	1-D8	4907	1-I1	7711	1-B6
1111	2-B19	2480	1-I15	2813	1-F11	3332	2-K6	3500	1-D7	702	1-D8	4957	1-M3	7720	1-D4
1150-A	2-B19	2481	1-I15	2814	1-F11	3333	2-K6	3501	2-D7	703	1-D8	5410	1-F18	7721	1-B4
1150-B	2-B19	2482	1-I15	2815	1-F11	3334	2-K6	3502	2-D7	704	1-D8	5411	1-E18	7730	1-C3
1150-C	2-B19	2483	1-I15	2816	1-F11	3335	2-K6	3503	2-D7	705	1-B7	5430	1-J18	7800	1-C11
1180-A	2-B19	2490	2-N15	2817	1-G3	3336	2-K6	3504	2-G7	706	1-B8	5431	1-J18	7805	2-D9
1180-B	2-B19	2491	1-M15	2818	1-H1	3337	2-K6	3505	2-G7	707	1-D8	5450	1-N18	7900-1	1-F3
1250	2-L14	2492	1-N15	2819	1-G4	3338	2-K6	3506	2-G7	708	1-D8	5451	1-N18	7922	1-L8
1550	2-L14	2493	1-M14	2820	1-G4	3339	2-K6	3507	2-G7	710	1-D8	5701	1-D8		
1601	1-I12	2500	2-D6	2821	1-I12	3340	2-K6	3508	2-G7	711	1-D8	5711	1-D5		
1610	1-G5	2501	2-C6	2822	1-I12	3341	2-K6	3509	2-G7	712	1-D8	5721	1-D4		
1700	1-A8	2502	2-C6	2823	1-I12	3342	2-K6	3510	2-G7	713	1-D8	6111	2-C17		
1701	1-C2	2505	2-H6	2824	1-I12	3343	2-K6	3511	2-G7	714	1-D8	6112	2-B17		
1710	1-A6	2506	2-G6	2825	1-I12	3344	2-K6	3512	2-G7	715	1-D8	6121	2-D17		
1720	1-A4	2507	2-G6	2826	1-I12	3345	2-K6	3513	2-G7	716	1-D8	6131	2-D17		
1950	2-N4	2509	2-A3	2827	1-I12	3346	2-K6	3514	2-G7	717	1-D8	6141	2-D17		
2110	2-B19	2510	2-B3	2828	1-H1	3347	2-K6	3515	2-G7	718	1-D8	6151	2-D17		
2111	2-G15	2511	2-B3	2829	1-H1	3348	2-K6	3516	2-G7	719	1-D8	6161	2-D17		
2120	2-G15	2512	2-D4	2830	1-H1	3349	2-K6	3517	2-G7	720	1-D8	6171	2-D17		
2130	2-G15	2513	2-D4	2831	1-H1	3350	2-K6	3518	2-G7	721	1-D8	6181	2-D17		
2140	2-G15	2514	2-D4	2832	1-H1	3351	2-K6	3519	2-G7	722	1-D8	6191	2-D17		
2150	2-G15	2515	2-D4	2833	1-H1	3352	2-K6	3520	2-G7	723	1-D8	6201	2-D17		
2160	2-G15	2516	2-D4	2834	1-H1	3353	2-K6	3521	2-G7	724	1-D8	6211	2-D17		
2170	2-G15	2517	2-D4	2835	1-H1	3354	2-K6	3522	2-G7	725	1-D8	6221	2-D17		
2180	2-G15	2518	2-D4	2836	1-H1	3355	2-K6	3523	2-G7	726	1-D8	6231	2-D17		
2190	2-G15	2519	2-D4	2837	1-H1	3356	2-K6	3524	2-G7	727	1-D8	6241	2-D17		
2191	2-G15	2520	2-D4	2838	1-H1	3357	2-K6	3525	2-G7	728	1-D8	6251	2-D17		
2200	2-G15	2521	2-D4	2839	1-H1	3358	2-K6	3526	2-G7	729	1-D8	6261	2-D17		
2210	2-G15	2522	2-D4	2840	1-H1	3359	2-K6	3527	2-G7	730	1-D8	6271	2-D17		
2220	2-G15	2523	2-D4	2841	1-H1	3360	2-K6	3528	2-G7	731	1-D8	6281	2-D17		
2230	2-G15	2524	2-D4	2842	1-H1	3361	2-K6	3529	2-G7	732	1-D8	6291	2-D17		
2240	2-G15	2525	2-D4	2843	1-H1	3362	2-K6	3530	2-G7	733	1-D8	6301	2-D17		
2250	2-G15	2526	2-D4	2844	1-H1	3363	2-K6	3531	2-G7	734	1-D8	6311	2-D17		
2260	2-G15	2527	2-D4	2845	1-H1	3364	2-K6	3532	2-G7	735	1-D8	6321	2-D17		
2270	2-G15	2528	2-D4	2846	1-H1	3365	2-K6	3533	2-G7	736	1-D8	6331	2-D17		
2280	2-G15	2529	2-D4	2847	1-H1	3366	2-K6	3534	2-G7	737	1-D8	6341	2-D17		
2290	2-G15	2530	2-D4	2848	1-H1	3367	2-K6	3535	2-G7	738	1-D8	6351	2-D17		
2300	2-G15	2531	2-D4	2849	1-H1	3368	2-K6	3536	2-G7	739	1-D8	6361	2-D17		
2310	2-G15	2532	2-D4	2850	1-H1	3369	2-K6	3537	2-G7	740	1-D8	6371	2-D17		
2320	2-G15	2533	2-D4	2851	1-H1	3370	2-K6	3538	2-G7	741	1-D8	6381	2-D17		
2330	2-G15	2534	2-D4	2852	1-H1	3371	2-K6	3539	2-G7	742	1-D8	6391	2-D17		
2340	2-G15	2535	2-D4	2853	1-H1	3372	2-K6	3540	2-G7	743	1-D8	6401	2-D17		
2350	2-G15	2536	2-D4	2854	1-H1	3373	2-K6	3541	2-G7	744	1-D8	6411	2-D17		
2360	2-G15	2537	2-D4	2855	1-H1	3374	2-K6	3542	2-G7	745	1-D8	6421	2-D17		
2370	2-G15	2538	2-D4	2856	1-H1	3375	2-K6	3543	2-G7	746	1-D8	6431	2-D17		
2380	2-G15	2539	2-D4	2857	1-H1	3376	2-K6	3544	2-G7	747	1-D8	6441	2-D17		
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2500	2-G15	2551	2-D4	2869	1-H1	3388	2-K6	3556	2-G7	759	1-D8	6561	2-D17		
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2640	2-G15	2565	2-D4	2883	1-H1							6701	2-D17		
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2660	2-G15	2567	2-D4	2885	1-H1							6721	2-D17		
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2700	2-G15	2571	2-D4	2889	1-H1							6761	2-D17		
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2720	2-G15	2573	2-D4	2891	1-H1							6781	2-D17		
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2740	2-G15	2575	2-D4	2893	1-H1							6801	2-D17		
2750	2-G15	2576	2-D4	2894	1-H1							6811	2-D17		
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2870	2-G15	2													

J5 HDR2K4 HOP 28KHZ AP AUG

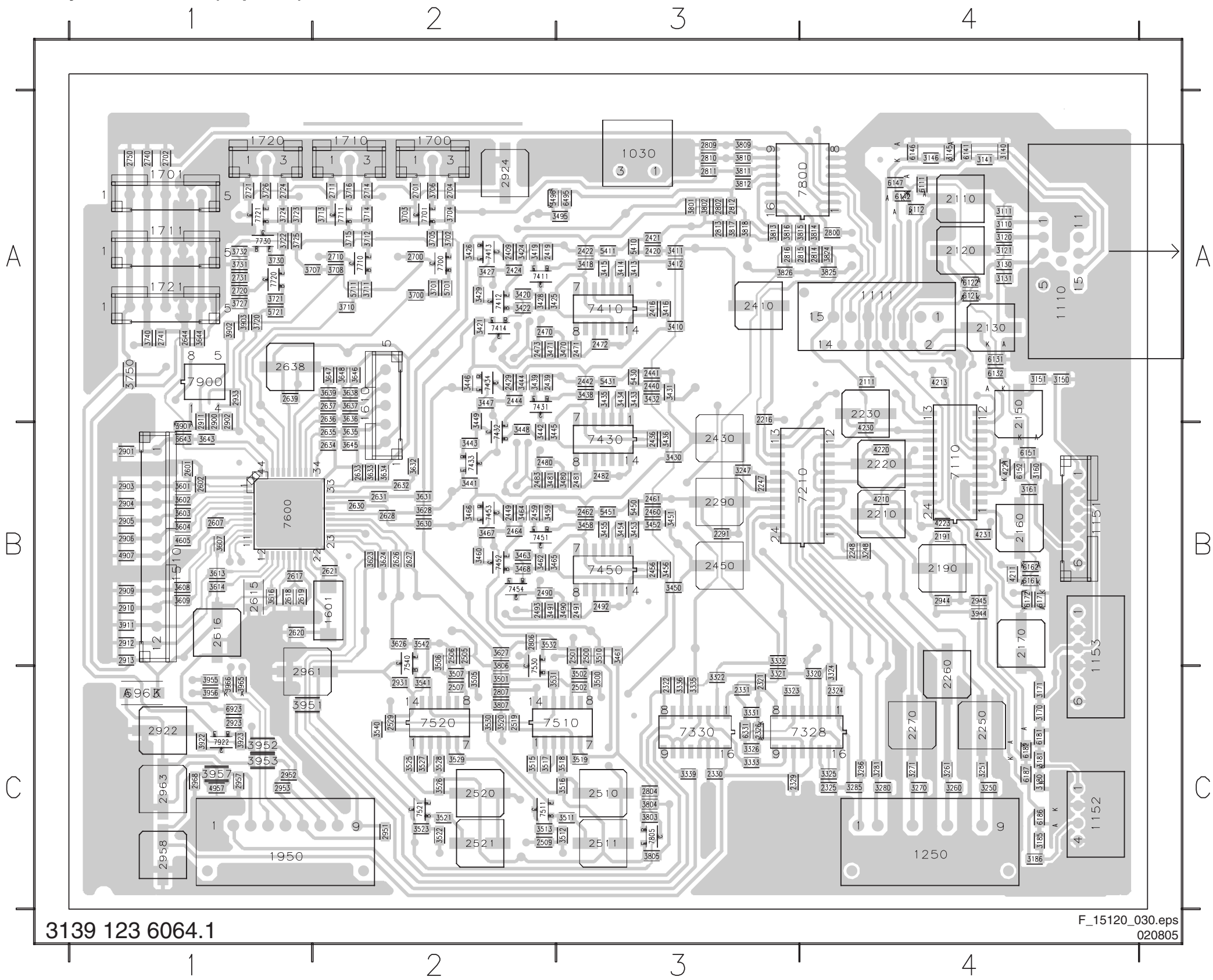
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F809	1-E10
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F816	1-E13
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F911	1-J3
F912	1-J3
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F954	1-N4
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F956	1-L8
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3135 033 3429.2

E_15000_046.eps
191004

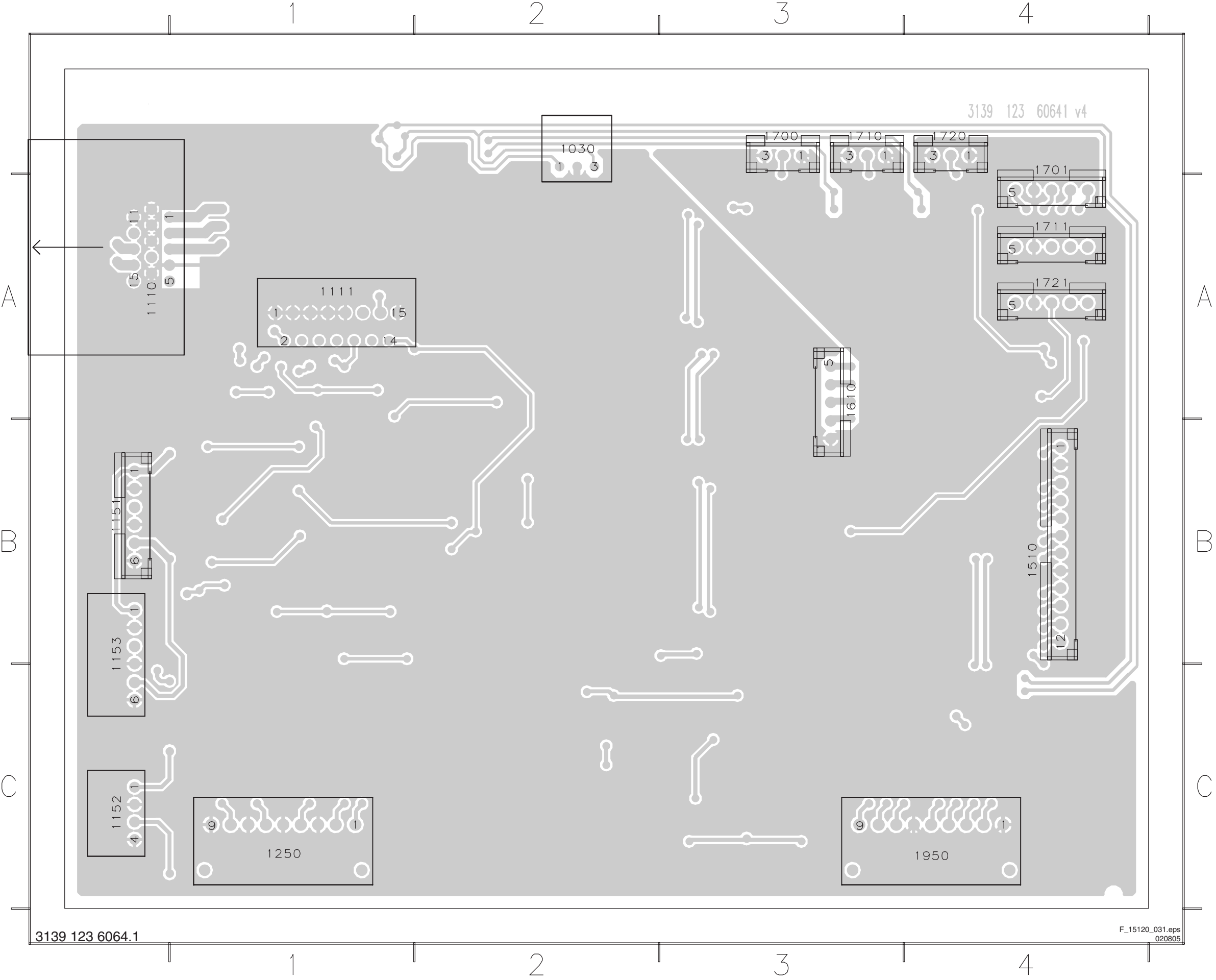
This image shows a full page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E_06532_012.eps" followed by "131004" on the next line.

Layout HOP Panel (Top Side)



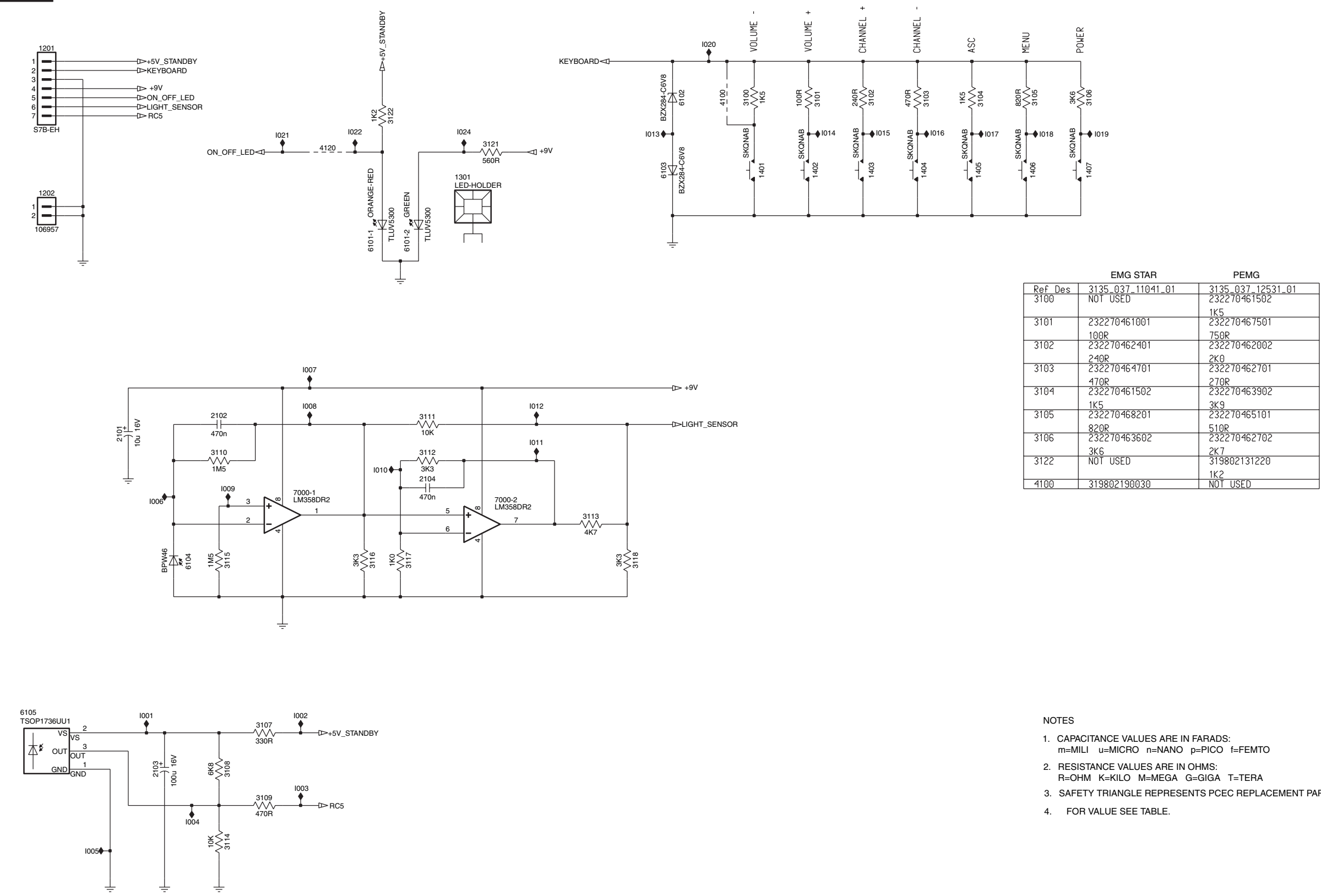
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1153	B4	2601	B1	3151	A4	3471	A2	3725	A1	7210	B4
1250	C4	2602	B1	3160	B4	3480	B3	3726	A1	7328	C4
1510	B1	2607	B1	3161	B4	3481	B2	3727	A1	7330	C3
1601	B2	2615	B1	3170	C4	3490	B3	3730	A1	7410	A3
1610	A2	2616	B1	3171	C4	3491	B2	3731	A1	7411	A2
1700	A2	2617	B1	3180	C4	3495	A3	3732	A1	7412	A2
1701	A1	2618	B1	3181	C4	3496	A2	3740	A1	7413	A2
1710	A2	2619	B1	3185	C4	3500	C3	3750	A1	7414	A2
1711	A1	2620	B1	3186	C4	3501	C2	3801	A3	7430	B3
1720	A1	2621	B2	3247	B3	3502	C3	3802	A3	7431	A2
1721	A1	2626	B2	3248	B4	3505	C2	3803	C3	7432	B2
1950	C1	2627	B2	3250	C4	3506	B2	3804	C3	7433	B2
2110	A4	2628	B2	3251	C4	3507	C2	3805	C3	7434	A2
2111	A4	2630	B2	3260	C4	3510	B3	3806	C2	7450	B3
2120	A4	2631	B2	3261	C4	3511	C3	3807	C2	7451	B2
2130	A4	2632	B2	3270	C4	3512	C3	3809	A3	7452	B2
2150	A4	2633	B2	3271	C4	3513	C2	3810	A3	7453	B2
2160	B4	2634	B2	3280	C4	3515	C2	3811	A3	7454	B2
2170	B4	2635	B2	3281	C4	3516	C3	3812	A3	7510	C3
2190	B4	2636	A2	3285	C4	3517	C2	3813	A3	7511	C2
2191	B4	2637	A2	3286	C4	3518	C3	3814	A4	7520	C2
2210	B4	2638	A1	3320	C4	3519	C3	3815	A4	7521	C2
2216	A3	2639	A1	3321	C3	3520	C2	3816	A3	7530	C2
2220	B4	2644	A1	3322	C3	3521	C2	3817	A3	7540	B2
2230	A4	2700	A2	3323	C3	3522	C2	3818	A3	7600	B1
2247	B3	2701	A2	3324	C4	3523	C2	3824	A4	7700	A2
2248	B4	2702	A1	3325	C4	3525	C2	3825	A4	7701	A2
2250	C4	2704	A2	3326	C3	3526	C2	3826	A3	7710	A2
2260	C4	2710	A2	3331	C3	3527	C2	3901	B1	7711	A2
2270	C4	2711	A2	3332	B3	3528	C2	3902	A1	7720	A1
2290	B3	2714	A2	3333	C3	3529	C2	3903	A1	7721	A1
2291	B3	2720	A1	3335	C3	3530	C2	3911	B1	7730	A1
2321	C3	2721	A1	3336	C3	3531	C2	3922	C1	7800	A4
2322	C3	2724	A1	3339	C3	3532	B2	3923	C1	7805	C3
2324	C4	2731	A1	3410	A3	3540	C2	3944	B4	7900	A1
2325	C4	2740	A1	3411	A3	3541	C2	3951	C1	7922	C1
2326	C3	2741	A1	3412	A3	3542	B2	3952	C1		
2329	C3	2750	A1	3413	A3	3601	B1	3953	C1		
2330	C3	2800	A4	3414	A3	3602	B1	3955	C1		
2331	C3	2802	A3	3415	A3	3603	B1	3956	C1		
2409	A2	2804	C3	3416	A3	3604	B1	3957	C1		
2410	A3	2806	B2	3418	A3	3607	B1	3965	C1		
2416	A3	2807	C2	3419	A2	3608	B1	3966	C1		
2419	A2	2809	A3	3420	A2	3609	B1	4210	B4		
2420	A3	2810	A3	3421	A2	3613	B1	4211	B4		
2421	A3	2811	A3	3422	A2	3614	B1	4213	A4		
2422	A3	2812	A3	3424	A2	3616	B1	4220	B4		
2424	A2	2813	A3	3425	A2	3623	B2	4221	B4		
2429	A2	2814	A4	3426	A2	3624	B2	4223	B4		
2430	B3	2815	A4	3427	A2	3626	B2	4230	B4		
2436	B3	2816	A3	3428	A2	3627	B2	4231	B4		
2439	A2	2900	A1	3429	A2	3628	B2	4605	B1		
2440	A3	2901	B1	3430	B3	3630	B2	4907	B1		
2441	A3	2902	A1	3431	A3	3631	B2	4957	C1		
2442	A3	2903	B1	3432	A3	3632	B2	5410	A3		
2444	A2	2904	B1	3433	A3	3633	B2	5411	A3		
2449	B2	2905	B1	3434	A3	3634	B2	5430	A3		
2450	B3	2906	B1	3435	A3	3635	B2	5431	A3		
2456	B3	2909	B1	3436	B3	3636	A2	5450	B3		
2459	B2	2910	B1	3438	A3	3637	A2	5451	B3		
2460	B3	2911	A1	3439	A2	3638	A2	5701	A2		
2461	B3	2912	B1	3441	B2	3639	A2	5711	A2		
2462	B3	2913	B1	3442	B2	3643	B1	5721	A1		
2464	B2	2922	C1	3443	B2	3644	A1	6111	A4		
2470	A2	2923	C1	3444	A2	3645	B2	6112	A4		
2471	A3	2924	A2	3445	B2	3646	A2	6121	A4		
2472	A3	2931	C2	3446	A2	3647	A2	6122	A4		
2473	A2	2933	A1	3447	A2	3648	A2	6131	A4		
2480	B2	2944	B4	3448	B2	3700	A2	6132	A4		
2481	B3	2945	B4	3449	A2	3701	A2	6141	A4		
2482	B3	2951	C2	3450	B3	3702	A2	6142	A4		
2483	B2	2952	C1	3451	B3	3703	A2	6146	A4		
2490	B2	2953	C1	3452	B3	3704	A2	6147	A4		
2491	B3	2957	C1	3453	B3	3705	A2	6151	B4		
2492	B3	2958	C1	3454	B3	3706	A2	6152	B4		
2493	B2	2961	C1	3455	B3	3707	A2	6161	B4		
2500	B3	2963	C1	3456	B3	3708	A2	6162	B4		
2501	B3	2968	C1	3458	B3	3710	A2	6171	B4		
2502	C3	3110	A4	3459	B2	3711	A2	6172	B4		
2505	B2	3111	A4	3460	B2	3712	A2	6181	C4		
2506	B2	3120	A4	3461	B3	3713	A2	6182	C4		
2507	C2	3121	A4	3462	B2	3714	A2	6186	C4		
2509	C2	3130	A4	3463	B2	3715	A2	6187	C4		
2510	C3	3131	A4	3464	B2	3716	A2	6331	C3		

Layout HOP Panel (Bottom Side)



Keyboard Panel

K1 KEYBOARD/LIGHT SENSOR AP

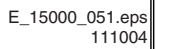


- NOTES
- CAPACITANCE VALUES ARE IN FARADS:
m=MILI u=MICRO n=NANO p=PICO f=FEMTO
 - RESISTANCE VALUES ARE IN OHMS:
R=OHM K=KILO M=MEGA G=GIGA T=TERA
 - SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
 - FOR VALUE SEE TABLE.

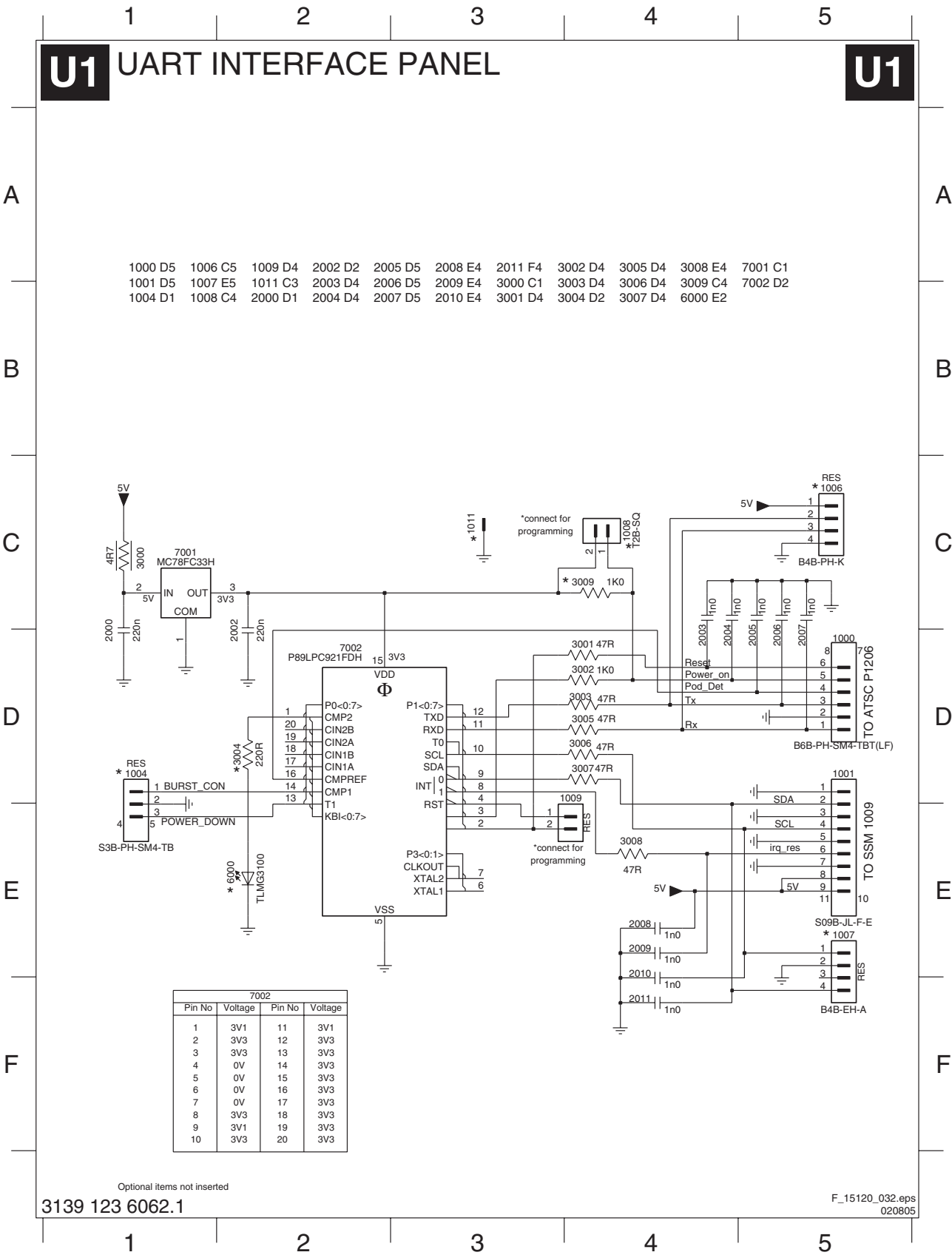
K2 KEYBOARD/LIGHT SENSOR AP			
REFDES	SH-ZONE	REFDES	SH-ZONE
1201	1-B1	I024	1-B5
1202	1-C1		
1301	1-C5		
1401	1-C8		
1402	1-C8		
1403	1-C9		
1404	1-C9		
1405	1-C10		
1406	1-C10		
1407	1-C11		
2101	1-F2		
2102	1-F3		
2103	1-F5		
2104	1-F5		
3100	1-B8		
3101	1-B8		
3102	1-B9		
3103	1-B9		
3104	1-B10		
3105	1-B10		
3106	1-B11		
3107	1-H3		
3108	1-I3		
3109	1-I3		
3110	1-F2		
3111	1-F5		
3112	1-F5		
3113	1-F6		
3114	1-I3		
3115	1-C3		
3116	1-C4		
3117	1-C4		
3118	1-C6		
3121	1-B5		
3122	1-B4		
4100	1-B7		
4120	1-B4		
6101-1	1-C4		
6101-2	1-C4		
6102	1-B7		
6103	1-C7		
6104	1-C2		
6105	1-H1		
7000-1	1-F3		
7000-2	1-F5		
REFDES	SH-ZONE		
I001	1-H2		
I002	1-H3		
I003	1-I3		
I004	1-I2		
I005	1-I2		
I006	1-F2		
I007	1-F3		
I008	1-F3		
I008	1-F3		
I009	1-F3		
I010	1-F4		
I011	1-F6		
I012	1-F6		
I013	1-B7		
I014	1-B8		
I015	1-B9		
I016	1-B9		
I017	1-B10		
I018	1-B10		
I019	1-B11		
I020	1-A7		
I021	1-B3		
I022	1-B4		

This image shows a full page of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E_06532_012.eps" and "131004".

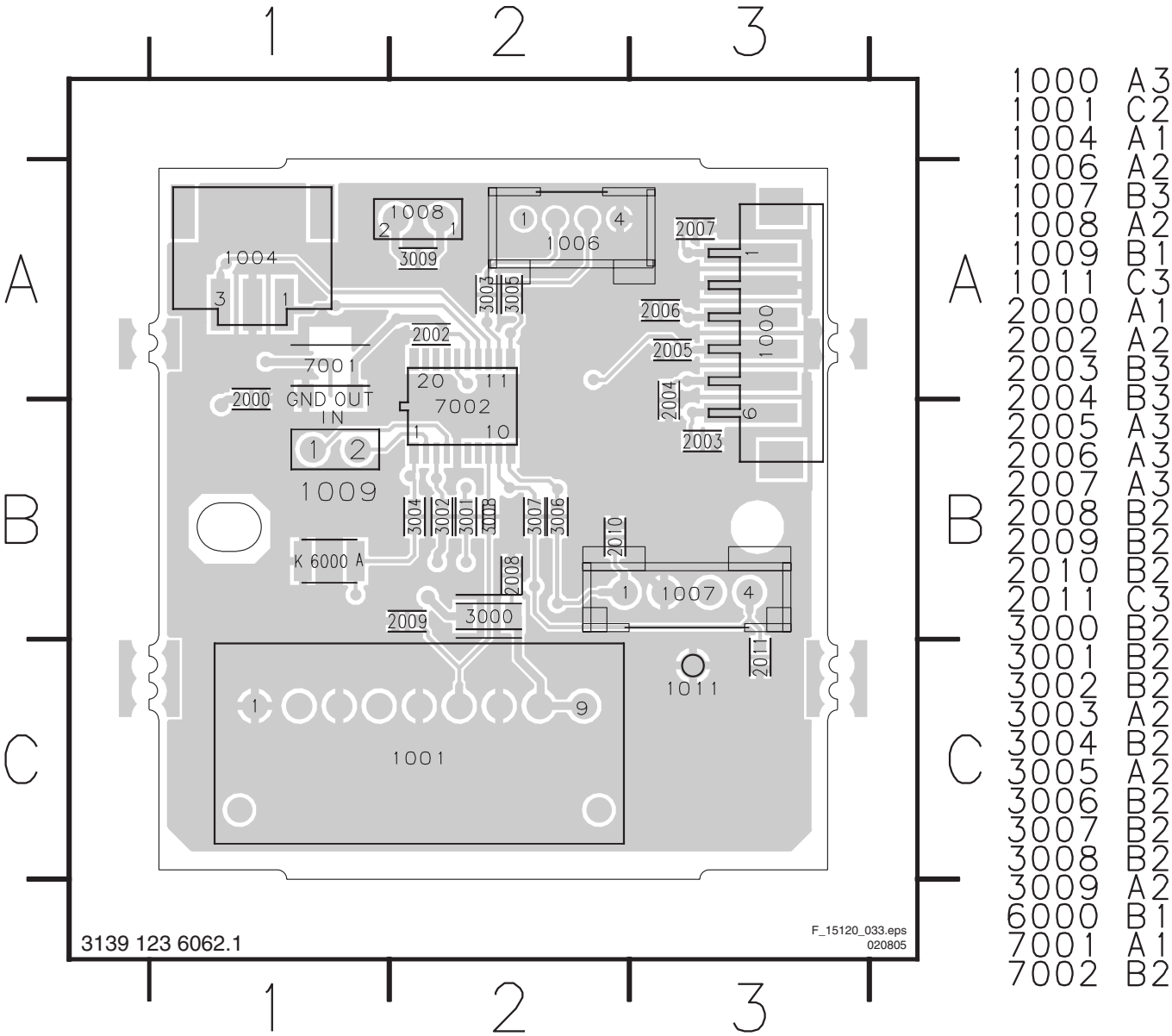
1201 --	1202 --	1301 --	1401 --	1402 --	1403 --	1404 --	1405 --	1406 --	1407 --	2101 --	2103 --	3109 --	6101 --	6104 --	6105 --	9102 --
---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------



UART Interface Module



Layout UART Interface Modukle



8. Alignments

Index of this chapter:

- 8.1 General Alignment Conditions
- 8.2 Hardware alignments
- 8.3 Software Alignments
- 8.4 Convergence and Geometry Adjustments
- 8.5 Option Settings

8.1 General Alignment Conditions

8.1.1 Start Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: according to countries standard ($\pm 10\%$).
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 10 to 20 minutes.
- Measure the voltages and waveforms in relation to chassis ground (with the exception of the voltages on the primary side of the power supply).
Caution: never use the cooling fins/plates as ground.
- Test probe: $R_i > 10 \text{ Mohm}$, $C_i < 20 \text{ pF}$.
- Use an isolated trimmer/screwdriver to perform the alignments.

8.2 Hardware alignments

8.2.1 VG2 Set-up

Preferred Method

1. Connect a Black Level signal to the aerial input of the set.
2. Preset all G2 controls on the Focus/G2 Combo Block to minimum (fully CCW).
3. Connect an Oscilloscope to the Collector of the output transistor on the Green CRT board. Set the probe to $\times 10$.
4. Adjust the Green G2 control until the Black Level is at 200 V.
5. Repeat steps 3 and 4 for the Red and Blue CRTs.

Alternate Method

1. Connect a Black Level signal to the aerial input of the set.
2. Preset all G2 controls on the Focus/G2 Combo Block to minimum (fully CCW).
3. Turn each G2 control clockwise until each CRT is barely illuminated.

8.2.2 Focus adjustment

Note: Before beginning the following adjustment procedures set the customer picture, sharpness, brightness, and tint controls to midrange and the customer colour control to minimum.

Electrical Focus Adjustment

1. Remove the back cover of the set and the light shield, then turn the set on and inject a crosshatch pattern signal into the antenna terminal.
Note: The crosshatch pattern will appear clearer if the front of the screen is covered with a dark cloth.
2. Cover two of the CRT output lenses with cardboard pieces (or other non-conductive opaque material) to observe the magnified reflection of the other picture tube on the backside of the viewing screen.
3. Adjust the CRTs focus control (located on the Screen/Focus Control Block) for the sharpest raster image.
4. Confirm correct focus by viewing the screen from the front of the set.

5. Repeat steps two through four to adjust the focus of the two remaining CRTs.

Note: Before beginning the following adjustment procedures set the customer picture, sharpness, brightness, and tint controls to midrange and the customer colour control to minimum.

Optical Focus Adjustment

1. Remove the back cover of the set and the light shield, then turn these on and inject an NTSC crosshatch pattern signal into the antenna terminal.
Note: The crosshatch pattern will appear clearer if the front of the screen is covered with a dark cloth.
2. Cover two of the CRT output lenses with cardboard pieces (or other non-conductive, opaque material) and observe the magnified reflection of the other picture tube on the backside of the viewing screen.
3. Loosen the "lens retaining wing nuts" on the CRT Focus Assembly.
4. Move the wing nut in the slot of the uncovered lens to locate the optimum optical focus viewing the picture from the back side of the screen), then re-tighten the wing nut.
5. Confirm correct focus by viewing the screen from the front of the set.
6. Repeat steps two through five to adjust the focus of the two remaining CRTs.

8.3 Software Alignments

With the software alignments, it is possible to align e.g. Geometry, White Tone, and Tuner IF settings.

Put the set in the SAM (see chapter 5 "Service Modes, Error Codes, and Faultfinding"). The SAM menu will now appear on the screen. Select, via the cursor, one of the sub-menus.

Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter: "0-6-2-5-9-6"-[i+]. Do not allow the display to time out while entering the key sequence. The following menu will appear:

Table 8-1 Alignments menu and default values

Alignments	Item	Default
General	Luma gain	3
	IF AFC	80
	IF Lprime AFC	80
	Tuner AGC	20
	Tuner AGC Tuner 2	8
	Blend Intensity	16
Lum. Delay	Lum. Delay Pal B/G	11
	Lum. Delay Pal I	8
	Lum. Delay Secam	8
	Lum. Delay Bypass	11
GDE SAM	See menu on screen	

8.3.1 General

LUMA GAIN

Fixed setting of "2".

IF AFC

Supply, via a service generator or via off-air, a TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz (PAL) or 61.25 MHz (NTSC).

Alignment procedure:

1. During the IF AFC-parameter adjustment, one can see OSD feedback on the screen.
2. The OSD feedback can give 4 kinds of messages:
3. The first item (IN/OUT) informs you whether you are in or out of the AFC-window.
4. The second item (HIGH/LOW) informs you whether the AFC-frequency is too high or too low.

Table 8-2 OSD feedback of AFC alignment

AFC-window	AFC-frequency vs. reference
Out	High
In	High
In	Low
Out	Low

1. Adjust the IF AFC parameter until the **first** value is within the AFC window (= IN).
2. Next, adjust the IF AFC parameter until the **second** value is LOW.

IF LPRIME AFC

Same procedure as described above but with other signal source (SECAM L').

TUNER AGC

1. Connect the RF output of a video pattern generator to the antenna input.
2. From the generator, input a PAL B/G TV signal with a signal strength of approximately 2 mV and a frequency of 475.25 MHz (PAL) or 61.25 MHz (NTSC).
3. Measure the DC voltage on pin 1 of the (main) Tuner. You can adjust this voltage by adjusting the TUNER AGC item in the SAM menu. Alignment is correct when the DC voltage is just below 3.5 V.

IF AFC TUNER 2 (if present)

Use the same procedure as described above (under IF AFC) with the set switched to the DW source.

IF LPRIME AFC TUNER 2 (if present)

Use the same procedure as described above (under IF LPRIME AFC) with the set switched to the DW source.

TUNER AGC TUNER 2

Use the same procedure as described above (under TUNER AGC) with the set switched to the DW source. Measure on pin "1" of the DW Tuner.

BLEND INTENSITY

Use this alignment when you replace the microcontroller or the HOP. It aligns the level of transparency of the menu-picture blended into the main-picture.

Position the "Brightness", "Contrast", and "Colour" setting in the middle position (in the customer "Picture" menu).

1. Apply a signal with a 100 % white video pattern (white raster).
2. Connect an oscilloscope to pin 8 of connector 1298 of the CRT panel and measure the Red output level.
3. Align the BLEND INTENSITY parameter so that the blended signal is 65 % of the black-white amplitude. This will be about 1.3 V (blended signal) versus 2 V (full white signal).
4. The parameter can be adjusted from 0 to 31.

8.3.2 LUM. DEL. (Luminance Delay)

With this alignment, you place the luminance information exactly on the chrominance information (brightness is pushed onto the colour). Use a colour bar / grey scale pattern as test signal.

- **LUM. DELAY PAL BG:** Apply a PAL BG colour bar / grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value is "9".
- **LUM. DELAY PAL I:** Apply a PAL I colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value is "9".
- **LUM. DELAY SECAM:** Apply a SECAM colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value is "11".
- **LUM. DELAY BYPASS:** apply a NTSC colour bar/ greyscale pattern as a test signal. Adjust this value until the transients of the colour and black and white part of the test area are at the same position. Default value is "10".

8.3.3 GDE SAM

Specifications:

- Set display mode in service mode.
- Service blanking.
- Set geometry.
- Preset picture.
- Set white tone.
- Convergence disable for setting geometry.

The GDE SAM mode (GDE = Generic Display Engine), allows the Service Technician to set Geometry and White Tone (Grey Scale). This mode is controlled by the GDE microprocessor located on the ASC module. These settings are stored in an EEPROM located on the ASC module. The GDE SAM displays the Software version of the GDE microprocessor and the GDE Errors.

There are three settings for Geometry in the 4x3 aspect ratio sets and two for the 16x9 aspect ratio sets.

The signal for the 480p mode can be applied to the set via the HD YPbPr inputs or from the SSB when the set is in the NTSC mode. All Geometry alignments for this mode should be done with an NTSC signal selected.

Adjustments for the 1080i should be done with an HD 1080i signal applied to the set. The 4x3 aspect ratio sets have both a Full and Compressed mode that requires alignment.

The Service Blanking selection (SERV BLANK) will blank the bottom half of the picture. This selection is useful when adjusting the Yokes to level the picture.

The Clamp Pulse should be set to Normal for a 480p or NTSC signal. It should be set to 1080i for an HD signal.

The Convergence Processor selection will enable or disable Convergence drive. Convergence should be disabled when performing Centering or Geometry alignments.

8.4 Convergence and Geometry Adjustments**8.4.1 Introduction**

If the ACS module has been replaced, the following adjustments will be required in the order as shown:

1. Geometry.
2. Convergence.
3. Grey Scale (White Tone).

If the Large Signal Board (LSB) has been changed the following adjustment are required:

1. Geometry.
2. Convergence.

If one or more CRTs have been replaced:

1. Geometry.
2. Convergence.

3. Grey Scale (White Tone).

If the SSM (Small Signal Module) has been changed:

1. Convergence.

Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter: **0-6-2-5-9-6-[i+]**. Do not allow the display to time out while entering the key sequence.

Cursor down to the Alignments level and then Cursor right to locate the GDE SAM. Press the OK button to enter the GDE SAM mode.

Note: Read the complete following text before starting the alignments.

8.4.2 Screen Centring

If one or more CRTs are replaced, it will be necessary to perform Screen Centring.

1. Place the Convergence Template on the TV screen or place a string from corner to corner to determine the screen centre.
2. Apply a centre cross pattern to the TV.
3. Enter the SAM mode, described in the Geometry section and disable Convergence.
4. Cover the Red and Blue CRTs.
5. Using the Centring rings on the Green CRT, centre the cross onto the centre of the template.
6. Uncover the Red CRT and centre the Red onto the Green cross.
7. Follow the same procedure with the Blue CRT.

Note: Only perform the Screen Centring for the first mode to be adjusted. Do **not** repeat the adjustment for the other modes.

8.4.3 Geometry Alignment

The Geometry alignment data is stored in the NVM, located on the ACS module. Whenever the ACS module or the Large Signal Board (LSB) have been changed, a Geometry alignment will be necessary. The Geometry Alignment is performed in the GDE SAM alignment mode. Make sure the set is in the mode in which you wish to align before entering the SAM mode. Use the AV button on the Remote to select the input with a signal, applied after entering the SAM mode.

Apply a crosshatch pattern to the set. Cursor Down to CONV PROC in the menu and press the Right Cursor button to select. This will disable the Convergence drive. Select GEOMETRY in the menu and enter the following default values for the mode being adjusted.

Table 8-3 Geometry Default Values

	480p	1080i (full)				
Wide blank	7	7				
Horizontal Shift	21	21				
Horizontal Para	8	8				
E-W Width	30	30				
E-W Para	31	31				
E-W Trap	31	31				
Horizontal Bow	7	7				
Vertical Slope	36	36				
Vertical Ampl	47	47				
S Correction	31	31				
Vertical Shift	31	31				
Fast Blank	0	0				

After entering the default values, the E-W WIDTH, VERTICAL SLOPE, and VERTICAL AMP should be the only settings requiring further adjustment.

Note: Perform (and store) Convergence alignment after any changes to the Geometry.

8.4.4 Convergence Mode

There are two new screen sizes for the AP region incorporating a Digital Convergence system using 208 adjustment points. The Convergence Processor is located on the ACS (Automatic Convergence System) module. The Convergence drive circuits are located on the SSP (Small Signal Panel). Data for the Convergence and Geometry settings are stored in the EEPROM located on the ACS module.

If the CRTs, the Large Signal Panel (LSP), or the Small Signal Module (SSM) are changed, a complete Geometry and Convergence alignment will be necessary.

If the ACS module, the Small Signal Panel (SSP), or CRTs are changed, a complete Convergence alignment will be necessary.

To obtain the correct Geometry during Convergence, a template must be used. There are eight Geometry and Convergence settings, stored in the EEPROM on the ACS Module.

- 51 inch 16x9 aspect ratio - Use Template ST4183
- 60 inch 4x3 aspect ratio - Use Template ST4182

8.4.5 Convergence Alignment

Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter: **0-6-2-5-9-6-[i+]**. Do not allow the display to time out while entering the key sequence.

Make sure that a signal is applied to the set for the mode being adjusted.

Make sure that the set is in the mode you wish to adjust before entering the Convergence Alignment mode.

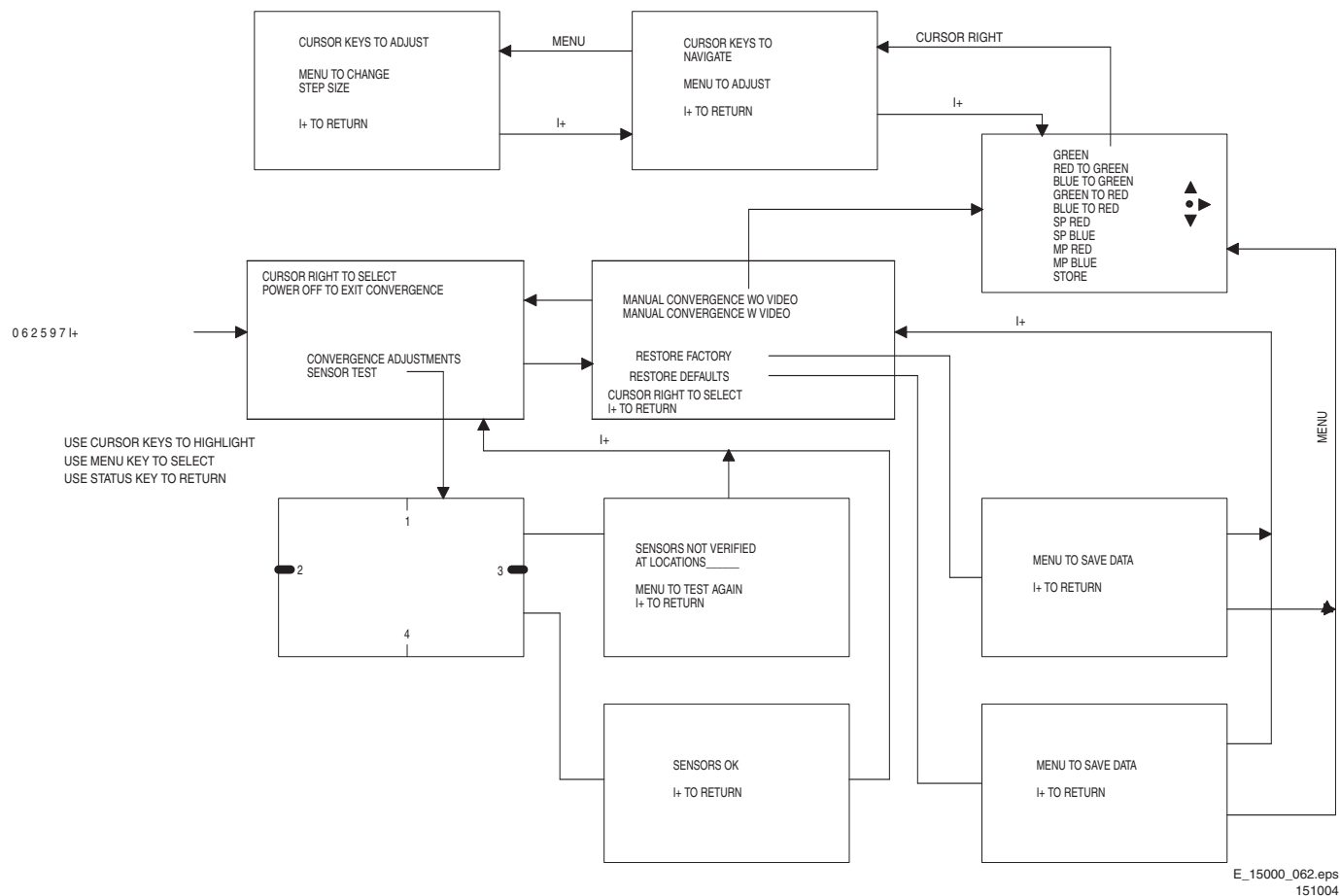


Figure 8-1 Convergence menus

Use the Cursor Up-Down button to highlight the selection. Press the Cursor Right button to make the selection. In the second menu:

- **MANUAL CONVERGENCE WO VIDEO** means that the screen behind the adjustment grid will be blank. This does not mean that Convergence can be performed without a signal being applied to the set.
- **MANUAL CONVERGENCE W VIDEO** displays the applied video behind the adjustment grid.
- **RESTORE FACTORY** loads the values from the last saved convergence alignment.
- **RESTORE DEFAULT** loads values from the ROM on the ACS Microprocessor.
- **RESTORE FACTORY** or **RESTORE DEFAULT** will overwrite all eight Convergence modes.

If the ACS module has been changed, there may not be data in the NVM for RESTORE FACTORY. The RESTORE DEFAULT settings will then be loaded.

An internally generated grid will be displayed in the Convergence mode as shown on the following page. The shaded area is the visible screen area. Horizontal lines A and M are displayed on the top and bottom edge of the visible screen area. Lines 1 and 15 are also displayed on the left and right edge of the visible screen area. Vertical line 0 is adjustable but not visible.

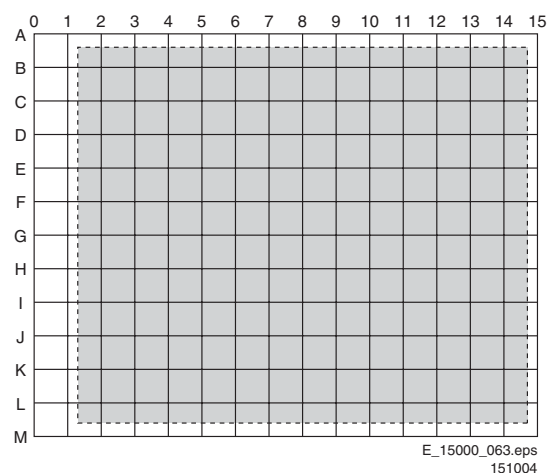


Figure 8-2 Convergence alignment grid

8.4.6 Single Tube Replacement Convergence

If a single tube has been replaced, it is not necessary to do a Major Convergence alignment.

1. Enter the Convergence mode and select the adjustment needed.
2. Select "Red to Green", for example if the Red tube has been replaced.
3. Adjust the centring rings on the CRT to centre the Red pattern onto the Green pattern.
4. Starting with the centreline, adjust the Red icon onto the Green pattern. Best results are obtained when navigating from left to right. Two or three passes may be necessary to obtain satisfactory results.

8.4.7 Touch Up Convergence

When making minor Convergence corrections, move the Cursor to the location to be adjusted then press the MENU button to adjust that location. When in the adjustment mode, press the MENU button a second time if it is desired to change the step size of the adjustment. When making minor Convergence corrections, you may adjust the following:

- RED TO GREEN
- BLUE TO GREEN
- SP RED
- MP RED
- SP BLUE
- MP BLUE

8.4.8 Green Geometry

Important: Do not make changes to the Green Geometry **without** placing a Template over the screen.

The Green Geometry must be done first when performing a complete convergence alignment. A Screen Template is necessary to obtain the correct geometry. Failure to use the Screen Template or mis-adjustment of the convergence will result in reduced life of the Convergence amplifiers.

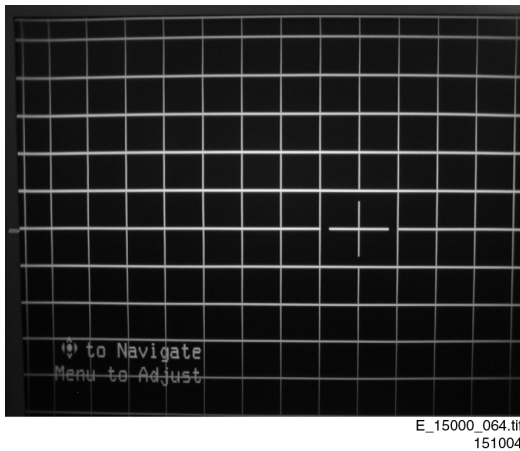


Figure 8-3 Screen shot of "Green geometry" adjustment

Place the Screen template on the TV screen. Select GREEN in the selection menu. The Cursor will appear in the centre of the screen as shown in the picture.

When the ACS module has been replaced, it would be advisable to load Default settings. Press the MENU button to adjust, and then use the Cursor buttons to move the Green cross onto the Template.

The adjustment of the cross has two-step sizes: large and small. Press the MENU button to toggle between the two. After a point has been adjusted, press the Index button to return to Navigate. When Default settings have been loaded, the left most line that is not visible should be adjusted first. Adjust the Vertical line 0 while observing line 1 to make line 1 parallel with the left edge of the screen. The adjustment should only be made in small steps.

Do not adjust any one point more than 1/4 the distance of one grid in each pass. After the left most line is adjusted, start at the centre left of the screen and work to the right, aligning the Horizontal lines. When adjusting the Horizontal lines, best results are obtained when working from left to right.

After the Centre line is adjusted, go to the next line down until all of the lines have been adjusted, then work from the centre up to adjust the Horizontal lines. Using the same method, work from centre out to adjust the Vertical lines. At least three passes will be necessary to complete the alignment. Press the Index button to return to the selection menu.

When the GREEN geometry is complete, STORE the data. Remove the template from the screen. Select RED TO GREEN in the selection menu. Using the same method that was used to adjust the Green Grid to the Template, adjust the Red Grid onto the Green Grid. If the set is a later production, select SP RED to centre the Red grid onto the Green grid. Exit this mode by pressing the MENU button. Then select the MP RED to adjust the Red onto the Green using the 35-point adjustment. When this is complete, select the RED TO GREEN to perform the 208-point adjustment.

When the RED TO GREEN is complete, select the BLUE TO GREEN, using the same alignment method as the RED TO GREEN.

Select STORE to save your the alignments after adjusting each colour. Each time data is stored; the Intellisense circuit will recalculate the position of the four sensors in the set.

Exiting the Convergence Mode without saving will cause the alignments to be lost.

Repeat the adjustment for each of the remaining modes.

8.4.9 Grey Scale Alignment

1. Place the input to the RGB (AUX 5) or YPbPr (AUX 4) mode. Connect a Computer or Computer monitor generator to the AUX 5 input or a Component Generator to AUX 4.
2. Preset the G2 controls counter clockwise.
3. Turn the Green G2 clockwise to make the menu visible.
4. Enter the SAM mode by entering **0-6-2-5-9-6-[i+]** on the Remote Control. Select the GDE mode and select WHITE TONE.
5. Preset the following registers: Use the Cursor Right-Left buttons to set the value. Use the Cursor Up-Down buttons to select the register. Press the MENU button to exit the WHITE TONE menu.
 - NORMAL RED CUT-OFF: "14"
 - NORMAL GREEN CUT-OFF: "35"
 - NORMAL BLUE CUT-OFF: "6"
 - NORMAL RED DRIVE: "44"
 - NORMAL GREEN DRIVE: "56"
 - NORMAL BLUE DRIVE: "43"
6. Set the BRIGHTNESS, PICTURE, and SHARPNESS to their midpoint position. Select a Black Raster pattern on the computer or computer monitor generator.
7. Connect an Oscilloscope, set to measure DC, to each cathode to determine the dominant (lowest) colour.
8. Adjust the SUB BRIGHTNESS control to set the Black Level equal to 180 Volts on the Oscilloscope.
9. Move the probe to the remaining cathodes and adjust the corresponding cut-off registers to make the black part of the waveform at 180 Volts.
10. Set the corresponding G2 control to just make cut-off for the black part of the waveform for that tube.
11. Remove the Oscilloscope probe.
12. Apply a Greyscale pattern to the set.
13. Adjust the Drive Controls to achieve the proper white balance. At least one drive should remain 3F.
14. The following Drives and Cut-offs should be set as listed. These are in the WHITE TONE menu.
 - COOL CUT-OFF RED: "0"
 - COOL CUT-OFF GREEN: "0"
 - COOL CUT-OFF BLUE: "0"
 - COOL DRIVE RED: "-9"
 - COOL DRIVE GREEN: "-7"
 - COOL DRIVE BLUE: "0"
 - WARM CUT-OFF RED: "0"
 - WARM CUT-OFF GREEN: "0"
 - WARM CUT-OFF BLUE: "0"
 - WARM DRIVE RED: "0"
 - WARM DRIVE GREEN: "0"

- WARM DRIVE BLUE: “-8”
- 15.Press the MENU button to return to the SAM menu. Exit the Service mode by turning the set "off".

8.5 Option Settings

8.5.1 Introduction

The microprocessor communicates with a large number of I2C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence / absence of these specific ICs (or functions) is made known by the option codes.

- Notes:**
- After changing the option(s), save them with the STORE command.
 - The new option setting is only active after the TV is switched "off" and "on" again with the Mains switch (the EAROM is then read again).

8.5.2 DEALER OPTIONS

Table 8-4 Dealer options

Menu name	Subjects	Options	Physically in set
Personal Options	Picture Mute	Yes	Picture mute active in case no picture detected
		No	Noise in case of no picture detected
	Virgin Mode	Yes	TV starts up once with language selection menu after mains switch on for the first time (virgin mode)
		No	TV does not starts up once with language selection menu after mains switch on for the first time (virgin mode)
	Auto Store Mode	None	Autostore mode disabled (not in installation menu)
		PDC-VPS	Autostore mode via ATS (PDC/VPS) enabled
		TXT page	Autostore mode via ACI enabled
		PDC-VPS-TXT	Autostore mode via ACI or ATS enabled
	TXT Preference	TOP	Preference to TOP Teletext
		FLOF	Preference to FLOF Teletext

8.5.3 SERVICE OPTIONS

Table 8-5 Service options

Menu name	Dual screen	TXT/EPG Dual Screen	Yes/No
Service Options	Video repro	Lightsensor	Yes/No
		2D Combfilter	Yes/No
		Pixel Plus	Yes/No
	Miscellaneous	Tuner Type	TEDE9/UV1316
	Opt. No.	Group 1	
		Group 2	

8.5.4 Option Codes

Enter the Service Alignment Mode (SAM) by pressing the following key sequence on the remote control transmitter: **0-6-2-5-9-6-[i+]**. Do not allow the display to time out while entering the key sequence.

Cursor to the OPT. NO. in the SERVICE OPTIONS level. Locate the “option code label” on the inside right panel of the unit and enter the correct codes for the model being serviced.

- Example**
- Group 1: 49483 32801 33055 32793
 - Group 2: 39897 32768 32768 00000

Note: Remember to cursor to the STORE OPTIONS level and select “OK” to save these changes

9. Circuit Descriptions, List of Abbreviations, and IC Data Sheets

Index of this chapter:

- 9.1 Introduction
- 9.2 Power Supplies
- 9.3 Video
- 9.4 Audio
- 9.5 Control/OSD
- 9.6 List of Abbreviations
- 9.7 IC Data Sheets

9.1 Introduction

This new chassis is being introduced for the Nafta region (USA and Canada) in 2005/2006 model year. The table below lists the Model and Chassis numbers.

Table 9-1 Model and chassis overview

Model	Chassis	Aspect Ratio	Destination
51MP6100D/37	DPTV585	16x9	USA/Canada
51PP9100D/37	DPTV585	16x9	USA/Canada
60PP9100D/37	DPTV585	16x9	USA/Canada

This chassis is derived from a previous introduced chassis but is prepared for ATSC reception. The chassis has NTSC and ATSC tuning capability. The digital broadcast formats it tunes are 8VSB and QAM. The set has the capability of displaying the 1080i, 480p, 480i and 720p high definition component analogue inputs. All are converted and displayed as 1080i. The 1fH RF inputs can be NTSC. The 1fH AV inputs can be YPbPr-component, composite, or SVHS and are displayed as 480p.

Some of the highlights are:

- TV-off air systems (NTSC).
- NTSC (3.58 - 4.5 MHz).
- HD signal inputs are analogue.
- Component in.
- ATSC digital in (8VSB and QAM).

The sets have 1fH multi-system composite, SVHS, and component inputs. The External 1fH or TV RF signals are fed to the Picnic and Eagle circuits, where the user can select between 100 Hz Digital Scan or Double lines.

External input systems:

- NTSC 3.58 MHz
- 480p, 480i, 1080i, 720p component input

All of the sets, based on the PEMG and have a 16x9 aspect ratio. There are eight different scan modes with each requiring separate geometry and convergence settings. Each of the modes has separate geometry and convergence data, stored in the NVM, located on the ACS (Automatic Convergence System) module.

Sound System processing is performed on the SSB (Small Signal Board). This is a multi-system sound decoding processor. The audio amplifier is located on the SSM (Small Signal Module). This is a digital amplifier; 10 Watt (2 x 5 Watts) for the 51" and 20 Watt (2 x 10 Watts) for the 60". There is also a Headphone output, located on the Side Jack Panel. The headphone amplifier is located on the SSM.

Sound system:

- 51": 10 W (2x5W) Audio.
- 60": 20 W (2x10W) Audio.
- Headphone Out.
- Speaker "on"/Off.

9.2 Power Supplies

The Rectifiers and Standby Supplies are located on the AC Input Panel. The Main Power Supply is located on the Large Signal Board (LSB).

In the table below, the models are listed with their respective voltage requirements. Auto Multi Voltage sets have a voltage range of 90 to 140 V.

Table 9-2 Voltage range overview

Model	Voltage Range
51MP6100D/37	90 - 140V nominal 110 V
51PP9100D/37	90 - 140V nominal 110 V
60PP9100D/37	90 - 140V nominal 110 V

9.2.1 Overall Power Supply Block

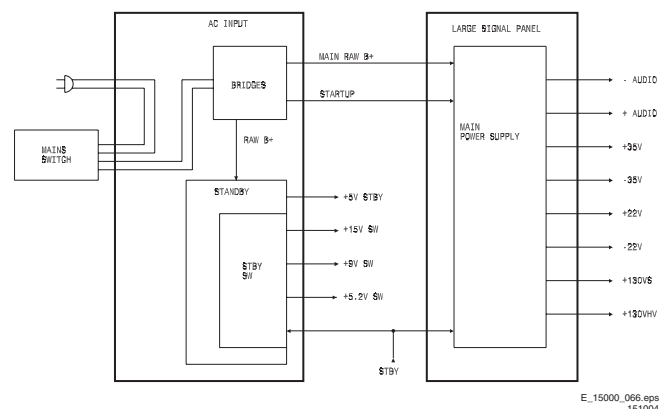
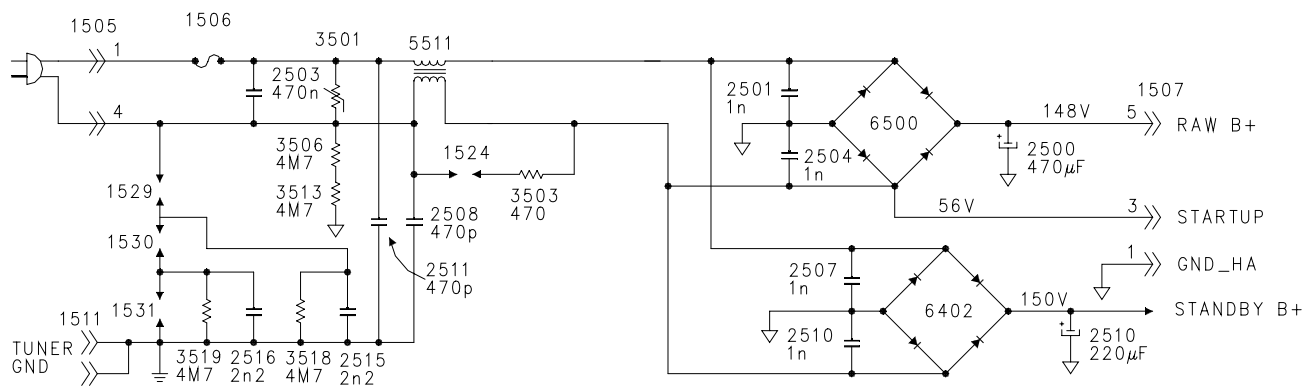


Figure 9-1 Power supply block diagram

The bridge rectifiers and Standby supply are located on the AC Input Panel. The Main Power supply is located on the Large Signal panel. A mains switch switches the AC power to the bridge rectifier, located on the AC Input panel. This switch must be turned "on", to place the set in the Standby mode. The Standby supply produces a +5 Volt standby voltage. In the Standby mode, the set consumes less than 1 W of power. When the set is turned "on", the microprocessor on the SSB causes the STANDBY line to go "low", switching the Standby supply to produce +15 V, +9 V, and +5.2 V sources. It also turns the Main Power supply "on", which produces the Audio, +35, -35, +22, -22, +130 V_S, and +130 V_HV supplies. The +130 V_S supply is for the Horizontal Output section. The +130 V_HV supplies power to the High Voltage section.

9.2.2 AC Input Board



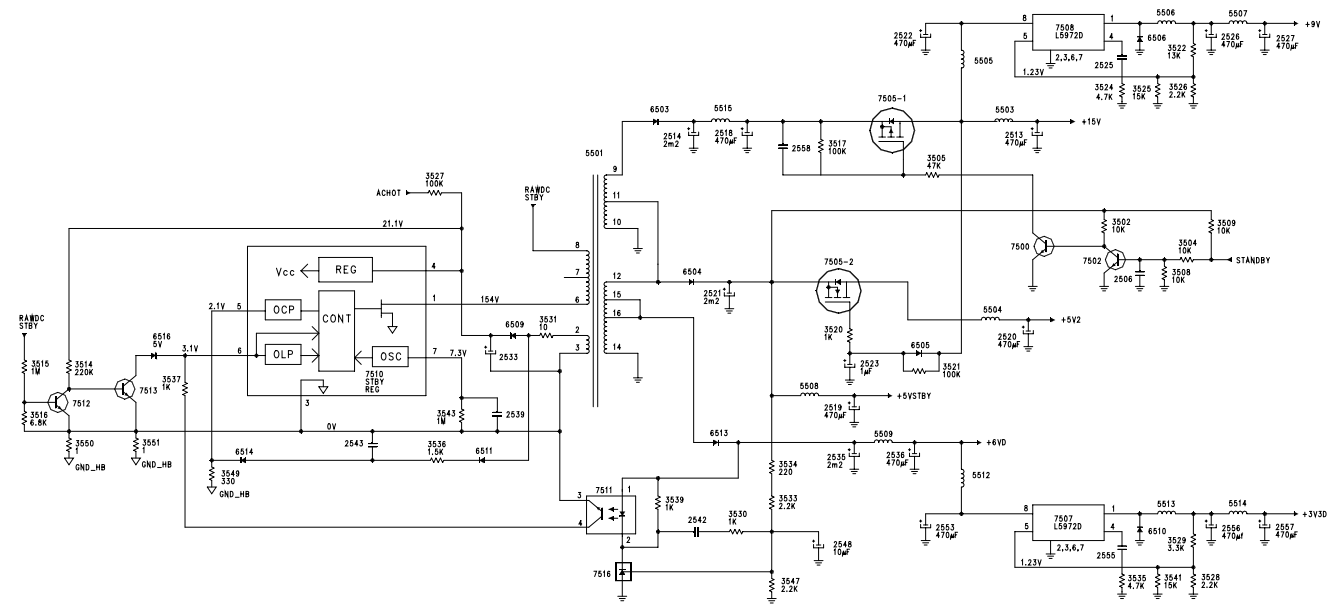
F_15120_040.eps
090805

Figure 9-2 AC input board

The AC Input circuit is located on the AC Input panel. AC power is connected to the AC Input panel via connector 1505. A 6.3 Amp Fuse, 1506 provides overcurrent protection. The Neutral side of the AC line is connected to a series of Spark Gaps, 1529, 1530, and 1531 to the Tuner Ground to protect the set from voltage surges. AC voltage is fed to Bridge rectifiers 6500

and 6402. Bridge 6500 provides the RAW B+ to the Main Power supply located on the LSB. The Neutral side of the AC line is also connected to the STARTUP for the Main supply. This provides the Startup voltage for the Main supply. Bridge 6502 provides the Raw DC for the Standby supply.

9.2.3 Standby Power Supply



F_15120_039.eps
090805

Figure 9-3 Standby power supply circuit

When power is applied to the set, Capacitor 2533 begins charging via startup Resistor 3527. When the voltage on Pin 4 of 7510 reaches approximately 19 volts, the IC begins switching Pin 1 of 7510. When Pin 1 goes Low, current flows through the windings of 5501 via Pins 8 and 6. Energy is coupled to the secondary windings. Operating voltage for the Standby supply after startup is supplied by windings connected to Pins 2 and 3. The +5STDBY is the reference supply for the regulation circuit. The +5STDBY supply is fed to the input of Shunt Regulator 7516 which drives Optoisolator 7511. If the 5-volt supply

increases, 7511 will turn on harder, reducing the feedback voltage on Pin 6 of 7510. If the 5 volt supply decreases, the voltage on Pin 6 will increase, causing the internal switch of 7510 to stay on longer.

Over voltage protection is accomplished by monitoring the voltage on Pin 5 of 7510. Voltage from Pin 2 of 5501 is rectified by Diode 6511 and is fed to Pin 5 via diode 6514. If this voltage goes above a certain level, 7510 will turn Off. If the DC voltage feeding 7510 decreases, the Feedback voltage on Pin 6 will increase. To prevent the IC from being overdriven, the voltage on Pin 6 is limited to 5 volts. In normal operation, DC from the

bridge rectifier is fed to the base of 7512, keeping it turned On. This keeps Transistor 7513 turned Off. If the DC voltage drops to approximately 75 volts, Transistor 7512 will turn Off, Transistor 7513 will turn On, putting the anode of Zener 6516 to ground, clamping the voltage on Pin 6 at 5 volts.

The Standby supply produces the +5STDBY, +6VD supplies when power is applied to the set. The +6VD supply feeds 7507 which produces a +3V3D supply. When the set is turned On, the Standby line from the microprocessor on the SSB goes Low. Transistor 7502 turns Off, turning Transistor 7500 On. 7500 turns Transistor 7505-1 On, switching the +15 volt supply On. The +15 volt supply also feed regulator 7508 to produce the +9 volt supply. Transistor 7505-2 also turns On, switching the +5V2 supply On.

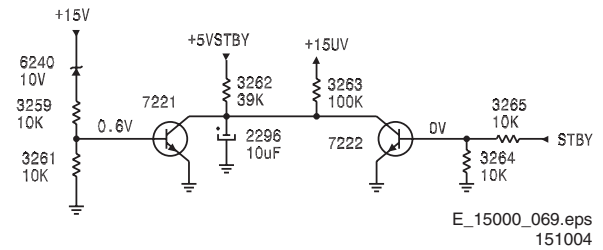


Figure 9-4 Under voltage detection circuit

If the 15-Volt supply drops below 11.2 Volts, transistor 7221 will turn "off". The 5-Volt standby supply will be applied to the base of 7220 (Figure " Standby power supply circuit") via resistors 3262 and 3263. This will cause the +15UV line to go "high". In the Standby mode, the Standby line is "high" turning transistor 7222 "on". When the set is turned "on", 7222 turns "off". Capacitor 2296 provides a delay to prevent the +15UV line from going "high" before the +15V supply turns "on".

This circuit can be defeated by grounding the base of transistor 7220. When repairs are complete, this jumper should be removed.

9.2.4 Main Power Supply

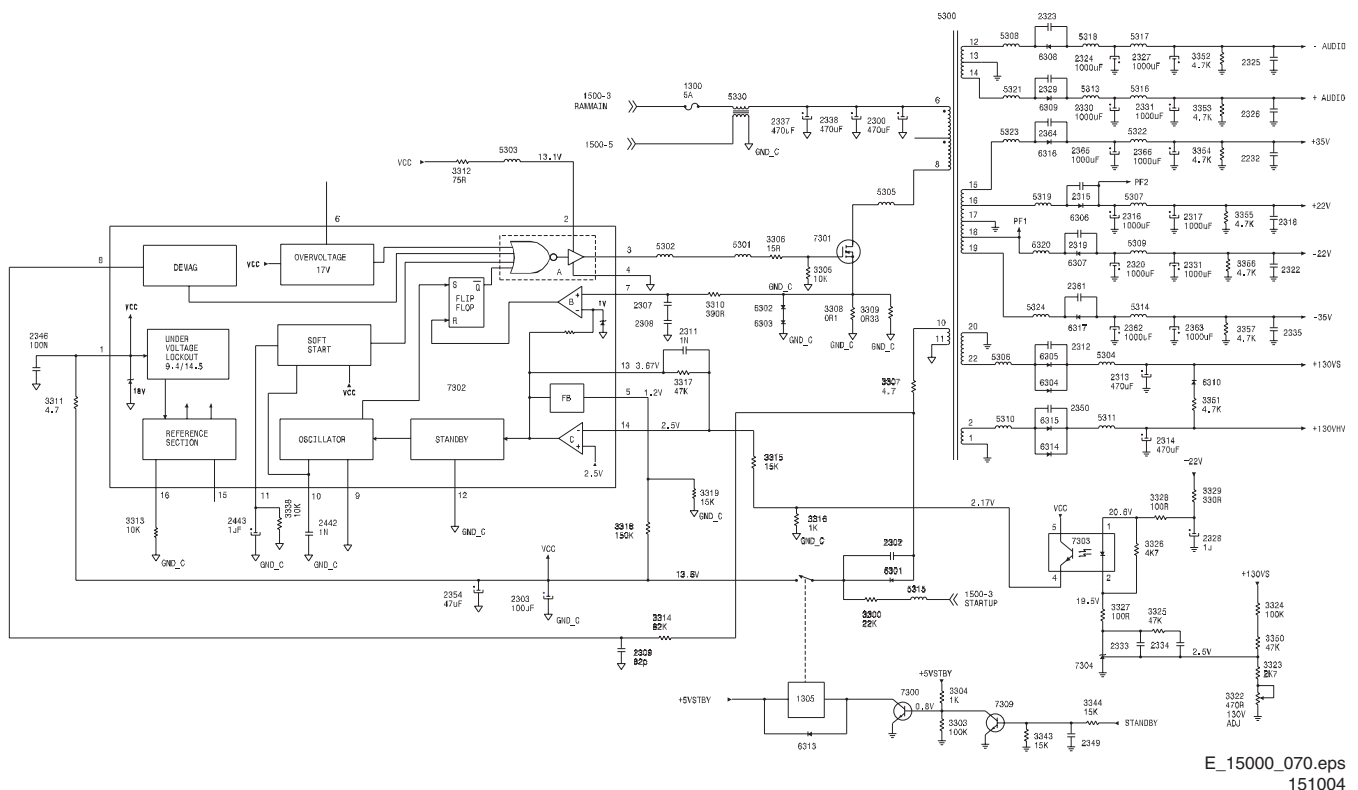


Figure 9-5 Main power supply circuit

The Main Power supply is located on the Large Signal panel. The Main B+ voltage from the Input panel is applied to the Main Power switching transistor, 7301, via Pins 6 and 8 of transformer 5300. This voltage is protected by fuse 1300 and filtered by choke 5330. The Standby line goes "low" when the set is turned "on". Transistor 7309 is turned "off", which turns 7300 "on". This turns relay 1305 "on". The Start-up voltage is applied to capacitor 2303 via resistor 3300. When 2303 charges to 14.5 Volts, the under-voltage lockout of 7302 connected to pin 1 is turned "on". Drive is output on pin 3 to the switching FET, 7301. This signal drives 5300 to produce the Main Power supply voltages. IC 7302 will continue to drive

5300 until the charges on capacitor 2303 drop below 9.4 Volts. The Under voltage Lockout of 7302 will then turn the output on pin 3 "off" until 2303 again charges to 14.5 Volts. After several start-up cycles, the operating voltage for 7302 is supplied by pin 10 of 5300.

Regulation is accomplished by monitoring the 130V_S supply via resistors 3324, 3350, 3323, and 3322. The feedback voltage is applied to the Shunt Regulator 7304, which drives the feedback opto-isolator 7303. The feedback voltage is applied to pin 14 of 7302. The voltage is fed to comparator "C" which is referenced to 2.5 Volts. This output of this comparator

sets the reference voltage for comparator "B", which is compared with the voltage on the source of 7301. This voltage is developed when 7301 turns "on", causing current to flow through resistors 3308 and 3309. If 7301 fails, Resistors 3308 and 3309 should be replaced. These are one percent tolerance resistors.

The Main Power supply produces: +130 V, +35 V, +22 V, -22 V, -35 Volt, a plus audio supply, and a minus audio supply. The Audio supply is a plus and minus 23 Volts. This supplies the digital audio amplifier located on the SSM (Small Signal Module).

When troubleshooting, notice that the Hot Ground for the Main Power supply is separated from the main Hot Ground on the AC Input Panel by Choke 5330. To ensure correct readings, use the Hot Ground in the Main power supply. If the power supply is overloaded or the operating voltage is missing, the voltage on pin 1 of the IC should be changing between 9.4 and 14.5 Volts. Each time the voltage reaches 14.5 Volts, drive should appear on pin 3 of the IC. If a voltage is present on pin 1 that is greater than 14.5 Volts and there is no drive on pin 3, the IC should be replaced. If drive is present on pin 3, check for drive on the Drain of 7301. If drive is present here, check for a short on the 130 Volt lines, a problem in the feedback circuit, or a problem with the operating voltage.

9.3 Video

Power Fail Shutdown

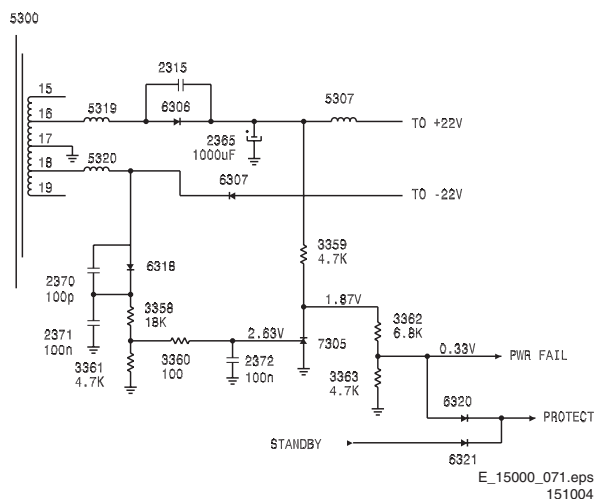


Figure 9-6 Power fail shutdown circuit

The +22 Volt supply is rectified by 6306 and the -22 Volt supply is rectified by 6307. The voltage on pin 18 of 5300 is monitored to detect a failure of the AC supply to the set. This circuit signals the microprocessor in the event that AC is removed from the set while it is turned "on". The voltage from pin 18 is rectified by 6318 and is applied to the Shunt Regulator 7305. Shunt Regulator 7305 is turned "on", keeping the Power Fail and Protect lines Low. When AC is removed while the set is "on", 7305 will turn "off" fast. This is because the filter capacitor for the input to 7305 is small. When 7305 turns "off", the Power Fail line goes "high" from the voltage on the +22 Volt line. The microprocessor will shut the set down while it still has voltage to operate.

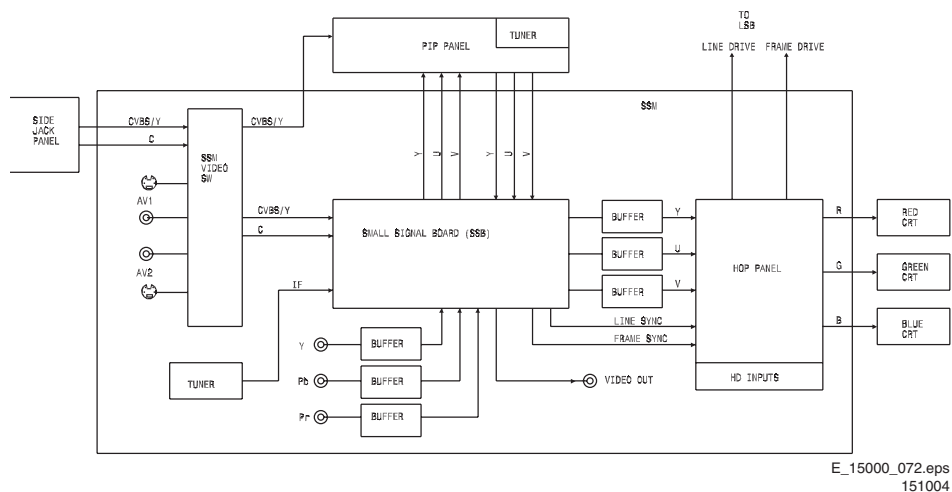


Figure 9-7 Video signal block diagram

The HDR2004 is a multi-system PTV. It will accept:

- RF inputs from NTSC, PAL, or SECAM.
- Composite or SVHS inputs from NTSC, PAL, or SECAM sources.
- Component YPbPr inputs from 1fH NTSC, PAL, or SECAM.
- YPbPr or RGB inputs from 480p, 576p, or 1080i sources.

Composite Video or SVHS YC from the Side Jack panel is fed to the video switch, located on the SSM (Small Signal Module). The SSM video switch selects between the composite inputs or SVHS inputs of the Side Jack panel or the inputs, located on the SSM. AV1 and AV2 inputs are located on the SSM. AV3 is

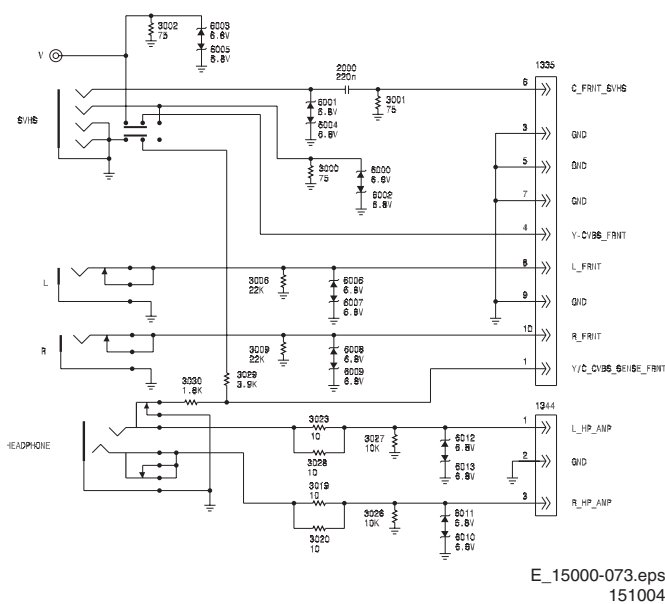
the Side Jack panel input. Selected composite video or YC is fed to the SSB (Small Signal Board), which plugs into the SSM. PAL, SECAM, or NTSC component video YPbPr is buffered and fed to the SSB. Selected composite video is fed to the PIP panel for the PIP window picture information. IF from the tuner located on the SSM is fed to the SSB. Composite video from the SSB, which is developed from the main Tuner, is fed to the Video Output jack on the SSM. Switching "on" the PIP panel selects between video from the Tuner on the PIP panel or selected Video from the SSM. YUV for the main picture from the SSB is fed to the PIP panel for the Picture in Picture information to be inserted. After insertion of the PIP information, the YUV signal is fed back to the SSB. A line

doubler circuit on the SSB, called the Feature Box, changes the interlaced 625 or 525 signal to a Progressive Scan 480p, 576p, 100Hz, or 120 Hz signal. This YUV signal is buffered and fed to the SSM where it is buffered before being fed to the HOP (High end Output Processor) panel. The HOP panel has the HD input jacks and DB15 RGB input. These inputs can be either 480p, 576p, or 1080i. The Video processing circuits on this panel perform the Colour, Tint, Brightness, and Contrast adjustments for the video. Signal selections between the signal from the SSB and the HD inputs are performed on the HOP panel. Sync processing and selection is also performed on the HOP panel. Red, Green, and Blue drive from the HOP panel is fed to the three CRT panels.

There are two sets of connectors, labelled YPbPr. The one on the SSM is for NTSC signal levels only. The one on the HOP is for 1080i, 576p, or 480p Progressive Scan only.

1fH Horizontal (Line) and Vertical (Frame) drive from the SSB is fed to the HOP via the SSM. The HOP panel selects between the sync from the SSB or the external HD inputs. These signals are processed on the HOP before being sent to the LSB.

9.3.1 Side Jack Panel



9.3.4 SSB Video Switching

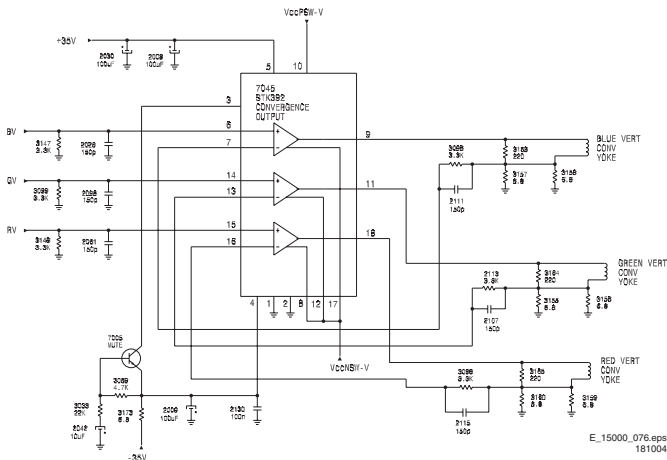


Figure 9-11 Video switching on SSB

Selected composite video from the SSM is fed to the HIP 7323, located on the SSB. IF from the main Tuner, located on the SSM, is fed to the SSB via connector 1020 to the switchable SAW filters 1408 and 1410. Refer to Figure "SAW filter switching circuit" for description of the SAW circuits. IF from the SAW filters is then fed to Pins 2 and 3 of 7323. composite Video is output on pin 10 and is buffered by 7411. Video is then fed to the switchable Sound traps. Refer to Figure "Sound trap switching circuit" for a description of the Sound Traps. Output from the Sound traps is buffered by 7322 and fed to pin 14 of 7323. IC 7323 then selects between the Tuner Video and selected composite Video or Luminance from the SSM on pin 20. If the signal selected is composite video, it is output on pin 26 and buffered by 7320. It is then fed to the Three Line Comb filter, 7307. Luminance is output on pin 14 and fed back to 7323 on pin 28. Chroma is output on pin 16 and fed to pin 29. The internal Chroma switch selects between the output of the Comb filter or external Chroma on pin 21. Selected Chroma is fed to the internal Demodulator, which outputs UV to the YUV switch. Selected Luminance is fed to the internal Delay and to the YUV switch.

The YUV switch selects between the YUV from the internal decoder and YUV from the YPbPr inputs located on the SSM. The microprocessor, located on the SSB, via the I2C buss, SDA-F and SCL-F, controls the HIP 7323. The YPbPr signals for NTSC are fed through buffer amplifiers on the SSM before being fed to the SSB. The selected YUV signal is output on Pins 49, 50, and 51 to the PIP/DW circuit via connector 1682.

The Y or Luminance signal is fed to the internal Sync Separator to develop Line and Frame sync. This sync is output on pin 60 and 61. pin 60 is the Line sync while pin 61 is the Frame sync. Line sync is also output on pin 59 to synchronize the Three Line Comb filter. When the Component input is selected by the YUV switch (a DVD player for example), the Y signal is selected by 7017 on the SSM and fed to pin 20 of 7323. The selected Y signal is then fed to the internal Sync Separator.

9.3.5 SAW Filter Switching

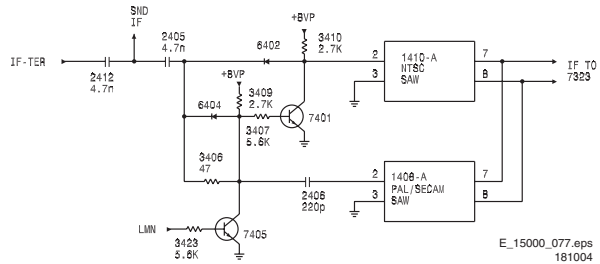


Figure 9-12 SAW filter switching circuit

The HDR2K3 AP set has a Multi-System tuning system. Since NTSC uses a 6 MHz bandwidth and PAL/SECAM uses an 8 MHz bandwidth, it is necessary to have separate SAW filters. The LMN line switches between PAL/SECAM and NTSC.

The LMN line goes "high" in the NTSC mode. Transistor 7405 turns "on" causing a short at the junction of resistor 3406 and capacitor 2406, removing the signal to the PAL/SECAM SAW filter (item 1408-A). Transistor 7401 is turned "off". Diode 6402 is forward biased via resistors 3410 and 3406, causing signal to be applied to pin 2 of 1410-A, and the NTSC SAW filter.

The LMN line goes "low" in the PAL/SECAM mode. Transistor 7405 turns "off", allowing signal to be applied to pin 2 of 1408-A, the PAL/SECAM SAW filter. Transistor 7401 is biased "on" via resistors 3409 and 3407. This prevents the signal from reaching pin 2 of 1410-A.

9.3.6 3D Comb Filter

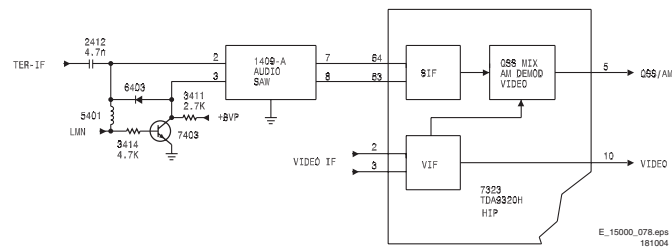


Figure 9-13 3D Comb Filter circuit

The 3D Comb Filter is used in NTSC only sets. This is a separate PC board, which plugs into the System board. The video signal is buffered by 7008 and 7009. Transistors 7010, 7015, 7016, and 7017 separate the Sync from the composite video. The Sync is fed to pin 76 of 7023. The composite video is buffered by 7011 and fed to a 6 MHz filter, 5006. This prevents any high frequency signals from causing any problems with the A/D conversion. The signal from 5006 is buffered by 7012 and fed to pin 88 of 7023. A full frame 3D YC separation is performed by the YCS circuit. The Y and C signals are buffered and fed to 6 MHz filters, 5003 and 5004. The YC signals are then fed back to the SSB via the SSM.

9.3.7 Sound Trap Switching

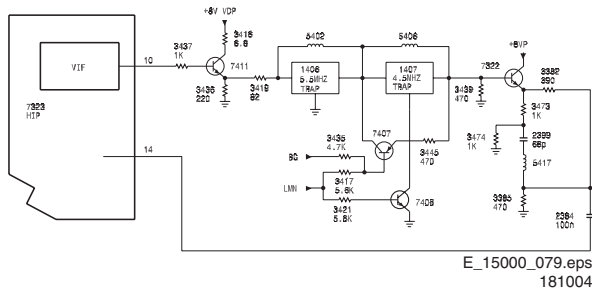


Figure 9-14 Sound trap switching circuit

Composite video is output on pin 10 of 7323 and buffered by transistor 7411. The signal is then applied to the 5.5 MHz trap, 1406. In the PAL/SECAM mode, the LMN line is Low, switching transistor 7407 "on", causing the signal to bypass 1406, the 4.5 MHz filter. The video is then buffered by transistor 7322 before being applied to pin 14 of 7323.

In the NTSC mode, the LMN line goes "high" and transistor 7406 turns "on", switching the 4.5 MHz SAW filter "on". Transistor 7407 is turned "off".

9.3.8 1fH Component Buffer Amplifiers

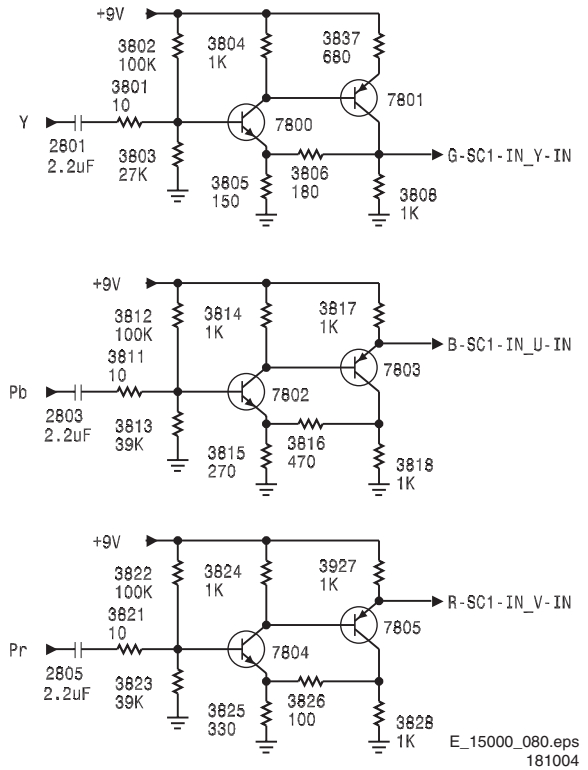


Figure 9-15 Component (YPbPr) buffers

The Y signal is buffered by transistors 7800 and 7801. This is an impedance matching and YPbPr to YUV circuit. This circuit does not invert the signal. The Pb signal is amplified by 7802 and buffered by 7803. The Pr signal is amplified by 7804 and buffered by 7805. The Pb and Pr signals are inverted.

9.3.9 Feature Box

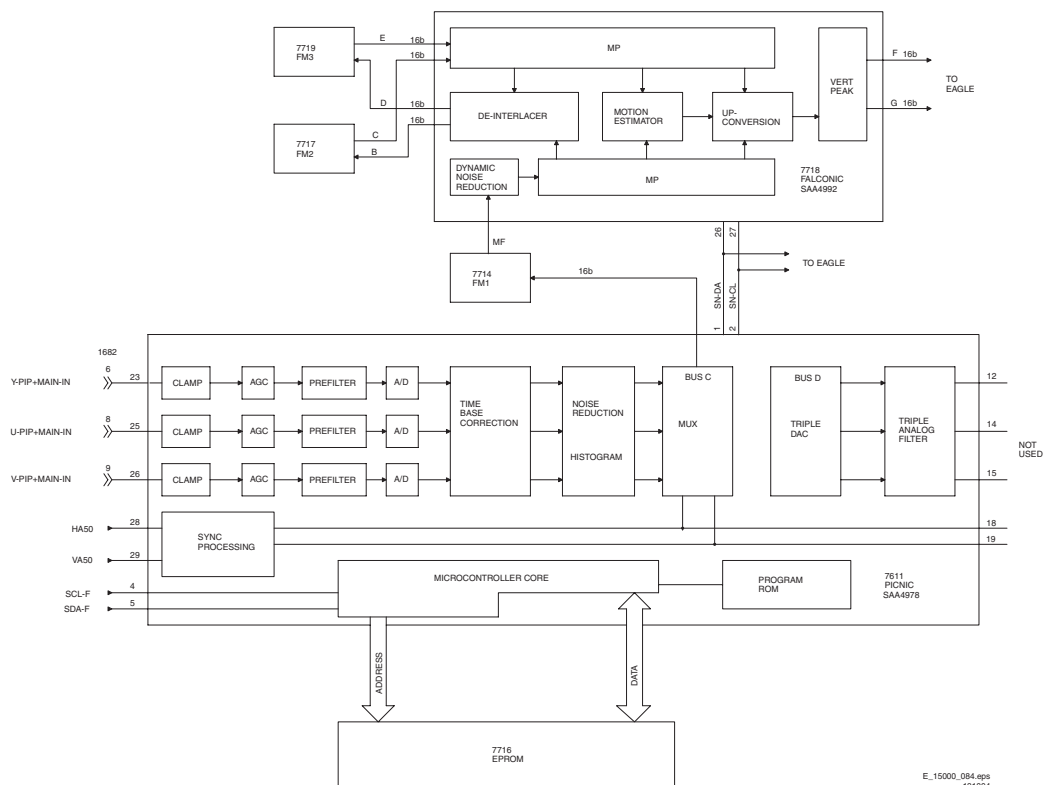


Figure 9-16 FBX block diagram

The circuit located on the SSB labelled the Feature Box performs the digitising, line doubling, and picture resizing. The main functions are performed by 7611, PICNIC (PICTure improvement Network IC), and 7718, FALCONIC (Field And Line Converter and Noise reduction IC). The PICNIC IC performs the A/D Analogue-to-Digital conversion while the FALCONIC performs the Line Doubling. The FALCONIC also performs the Super Zoom, Panoramic, 4:3, Movie Expand 14:9, Movie Expand 16:9, 16:9 Subtitle, and Widescreen picture format conversions.

The YUV signal is fed to the PICNIC on Pins 23, 25, and 26. Horizontal and Vertical Sync is fed to the IC on Pins 28 and 29. The signals are fed to a Clamping circuit to limit the sampling range, an AGC, and a Prefilter circuit. It is then fed to a triple A/D converter, Time Base Corrector, Noise Reduction and Histogram circuit, and a Multiplexer. The Prefilter circuit limits the bandwidth of the signals to prevent aliasing. Aliasing shows up as artefacts in the picture, which is caused by under sampling. The Multiplexer combines the three data streams.

Data is output from the PICNIC to FM1 (Field Memory), IC 7714. The Fields are ready by 7718 to the Dynamic Noise Reduction circuit and to the processor. The De-Interlace writes the Field data to Field Memory 2, 7717 and Field Memory 2, 7719. The Processor then reads the Field memories to convert the signal to a progressive scan signal. A Motion Estimator processes moving blocks in the picture to produce a natural motion. The processors resize the picture to fit the format selected by the user. However the picture appears to be formatted, the output is always a 480P or 576P format. The Signal is output on two 16-bit busses, F and G, to the Eagle processor.

The FALCONIC is controlled by the microprocessor in the PICNIC. The PICNIC is controlled by the Fast clock and data line from the OTC. The PICNIC communicates with the FALCONIC and the Eagle via the SNERT interface. SNERT is a No parity Eight-bit Reception and Transmission interface. Horizontal and Vertical sync is output on Pins 18 and 19.

9.3.11 ATSC module

9.3.10 Eagle

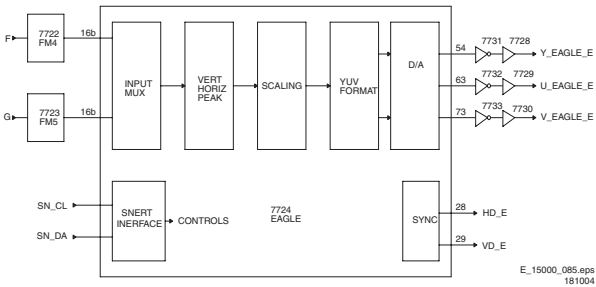


Figure 9-17 Eagle

The Eagle circuit provides Skin tone correction, Blue stretch, and Green Enhancement. In versions, equipped with the Pixel Plus feature, the Eagle IC performs the corrections for this mode.

The video frames are sent to FM4 and FM5, 7722 and 7723, memories from the FALCONIC IC. These memory ICs hold the frame data until they are required for processing by the Eagle. The Input Multiplexer selects which frame is to be read. The Vertical and Horizontal Peaking circuit sharpens the edges and adds blue pixels to enhance the picture. This circuit is part of the Pixel Plus processing.

The Scaling circuit scales the picture to a 100 Hz Digital Scan, 75 Hz Digital Scan, 576 progressive, or 480p progressive. If the input signal is from an NTSC source, only 75 Hz or 480p is available. The signal is converted to an analogue format and output on Pins 54, 63, and 73. Sync is output on Pins 28 and 29. The signal is then fed to a buffer circuit on the SSM and then to the HOP. The Eagle is controlled by the microprocessor in the PICNIC IC via the SNERT interface. The Eagle outputs an analogue YUV signal to the SSM (Small Signal Module).

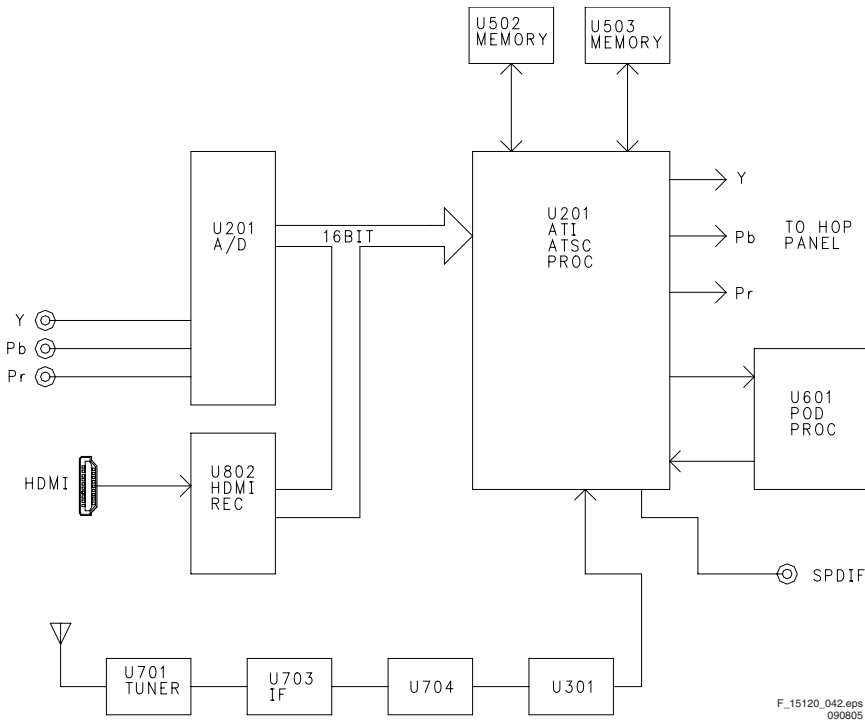


Figure 9-18 ATSC module

Component video from the YPbPr input is fed to U1201, switch. The YPbPr input on the ATSC module can be 480i, 480p, 720p, or 1080i. The A/D, U201 shares a 16bit bus with the HDMI receiver. Only the Philips version has the HDMI input. The Customer selected signal is fed to U201, the ATSC processor. The ATSC processor enhances and rescales the signals from these inputs. The ATSC tuner, U701, is fed to the IF section, U703, and then to filters U704 and U703. The ATSC processor can decode either 8VSB terrestrial, 64QAM, or 256QAM signals.

The output of the ATSC processor is fed to the POD processor IC. Most of the POD processing circuit is not present since this set does not have that feature. Two memory ICs, U502 and U503 stores the picture information while the video is being processed. The analog YPbPr 1080i signals are output to the HOP module.

9.3.12 SSM HOP Buffer Amplifiers

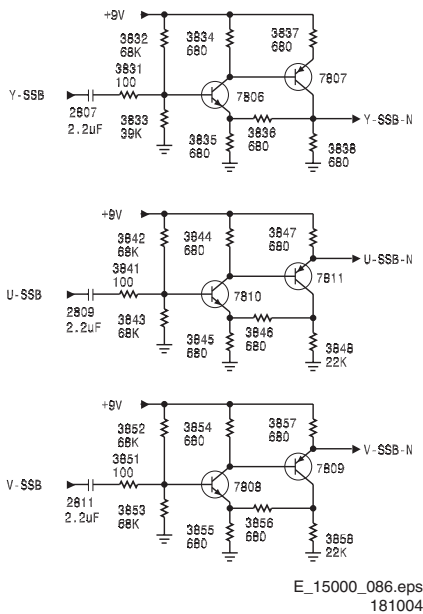


Figure 9-19 SSM YUV-buffers

The Y-SSB, U-SSB, and V-SSB signals are fed to buffer amplifiers, located on the SSM. Transistors 7806 and 7807 buffer the Y signal. The U signal is buffered and inverted by transistors 7810 and 7811. The V signal is buffered and inverted by transistors 7808 and 7809. The YUV signal is then fed to the HOP panel via connector 1250.

9.3.13 HOP RGB/YUV Switching

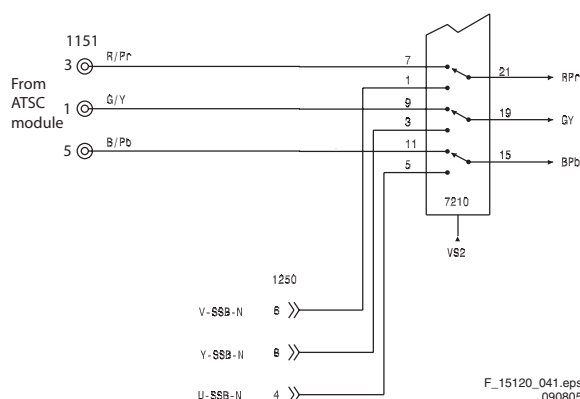


Figure 9-20 RGB/YUV switching

The input to the HOP panel can be RGB or YPbPr via the cinch connectors. The RGB or YPbPr signal can be either 480p, 720p progressive scan or 480i, 1080i interlaced.

IC7210 selects between the output of the ATSC panel and the YUV signal from the SSM.

The switch is controlled by the VS2 switching signal.

9.3.14 HOP Signal Processing

The Y/G, B/Pb, and R/Pr signals are fed to their respective sharpness controls. If the input is a YUV signal, the Y signal is fed to pin 28 of 7600. The U and V signals are fed to the Tint Control circuit and then to Pins 27 and 26 of 7600. If the input is RGB, the signals are fed to Pins 31, 32, and 30 of 7600 to an RGB to YUV converter. When RGB input is used, there is no Tint control available for the signal.

The input selector switch in 7600 selects between the YUV on Pins 28, 27, and 26 or the output of the internal RGB/YUV converter. The signal is fed to the RGB insertion circuits where the OSD is inserted. The signal is then fed to a White Point circuit and then to the Output Amplifier. The White Point and Output Amplifier have the Drive controls and Cut-off controls. Input from the ABL line on Pins 43 makes adjustments in the brightness levels to adjust for changes in beam current. The AKB pulses from the CRTs are fed to pin 44 to the Cathode Calibration circuit. The Cathode Calibration circuit adjusts the Cut-off levels of the CRTs to maintain the correct grey scale tracking. When the set is first turned "on", a calibration pulse is output on the RGB lines. The Cathode Calibration circuit monitors this pulse on the AKB line to set the Black level and the maximum drive voltage for the cathode. Once the Calibration has taken place, the Output Amplifiers switches to the RGB drive signal as the output.

Horizontal and Vertical Sync is fed to 7600 on Pins 23 and 24. IC 7600 processes the sync to provide the geometry for the picture. Horizontal drive is output to the sweep circuit on pin 8. Vertical drive is output on Pins 1 and 2. East West drive is output on pin 3. Sandcastle (SCO) is output on pin 9. Horizontal Feedback (HFB) from the sweep circuit is fed into the Phase Loop to phase correct the Horizontal drive.

IC 7600 is controlled by the microprocessor via the I2C buss on Pins 10 and 11. Geometry and Drive settings are stored in the Memory IC located on the HOP panel.

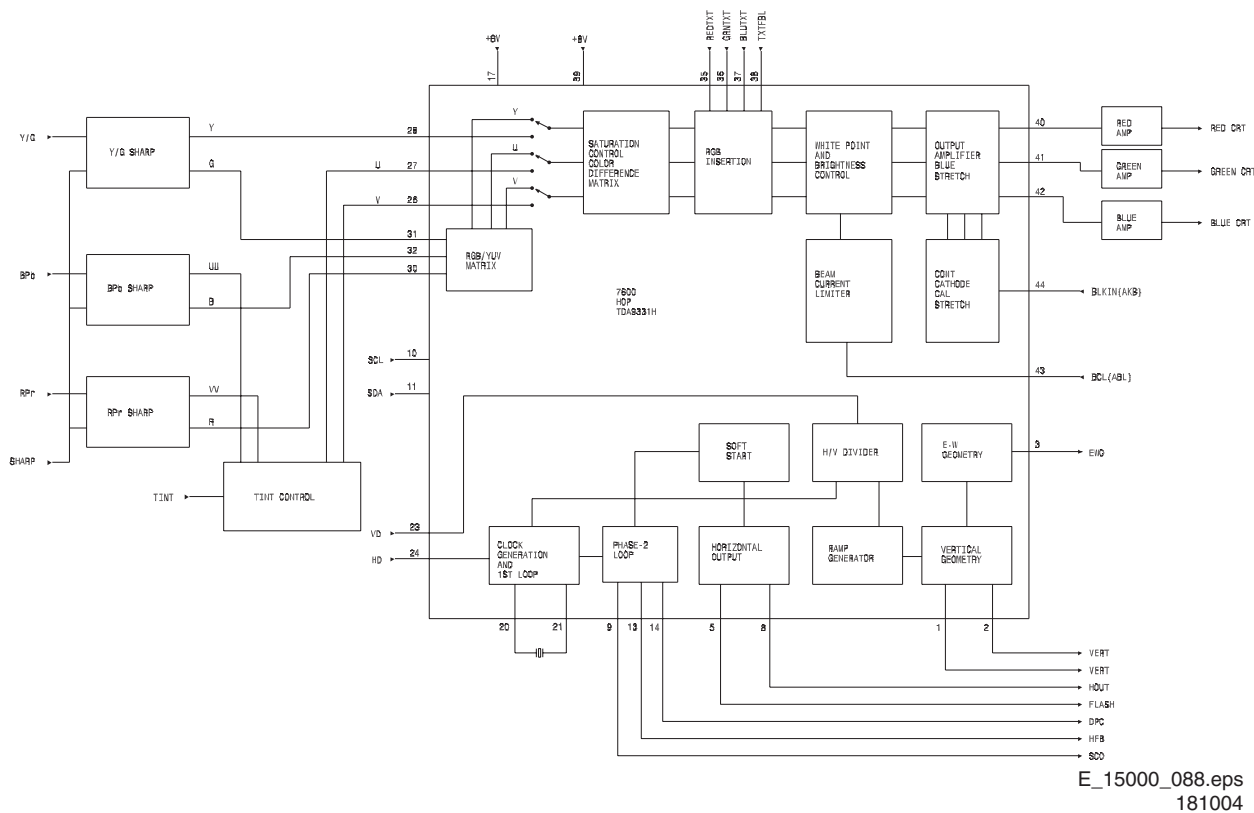


Figure 9-21 HOP signal processing

9.3.15 HOP Sharpness Control

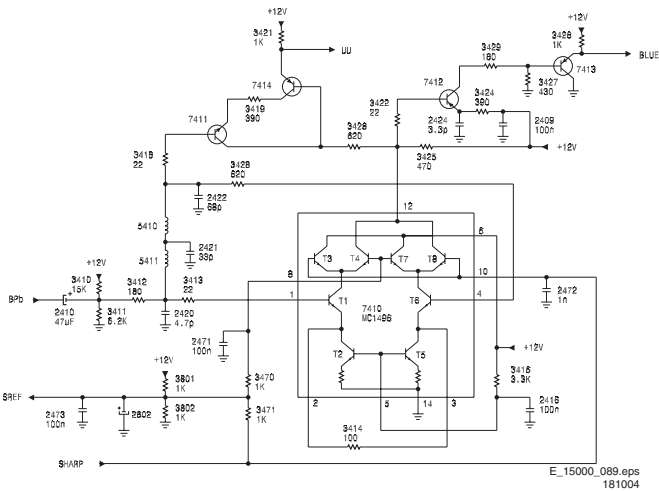


Figure 9-22 HOP sharpness control

The Sharpness controls for the YUV/RGB signals are located on the HOP panel. Since all three circuits are basically the same, only the Blue one will be discussed.

The Blue signal is fed to pin 1 of 7410. It is also fed to a Low Pass filter consisting of 5411 and 5410. This path is amplified by transistor 7411. The Low Pass filter blocks the higher frequencies as well as shifting the phase of the signal. The output of the Low Pass filter is also fed to pin 4 of 7410. The mixing of these two-phase shifted signals only allows the High frequency component to be amplified and output on pin 12. The gain of the High frequency component is controlled by the Sharpness voltage, which is applied to Pins 8 and 10. The two signals are combined at pin 12 of the IC. If the input was a Blue

signal, it is amplified by 7412 and buffered by 7413. If the input was a U signal, it is buffered by 7414.

9.3.16 HOP Tint Control

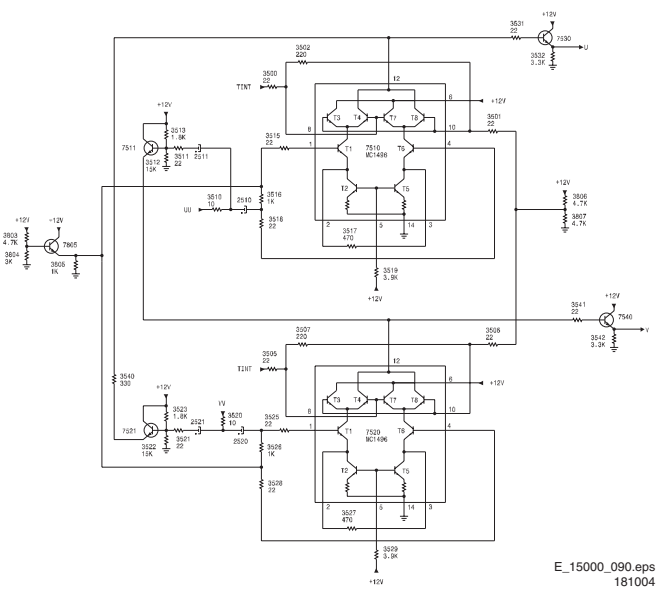


Figure 9-23 HOP tint control

IC 7510 amplifies the U signal while 7520 amplifies the V signal. The Tint control voltage changes the balance between the U and V signals to change, causing the tint of the picture to change.

9.3.17 HOP RGB Amplifiers

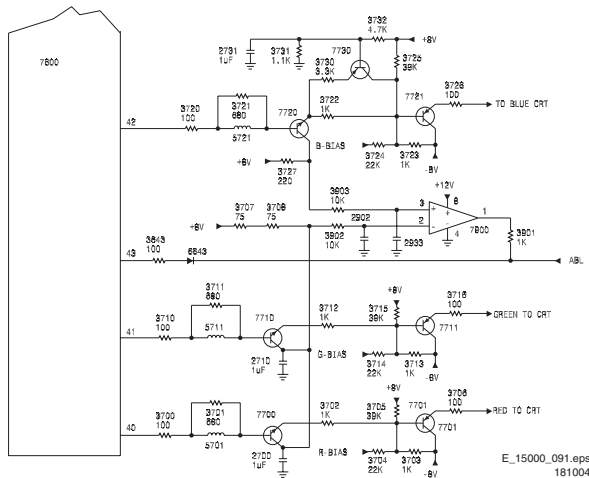


Figure 9-24 HOP RGB amplifiers

The output of 7600 is fed to the RGB amplifiers before being fed to the CRTs. Transistors 7720 and 7721 buffer the Blue output on pin 42. The B-BIAS control voltage controls the gain of this circuit. Transistor 7730 provides an additional voltage gain for the signal.

Items 7710 and 7711 buffer the Green output from pin 41 of 7600. The G-BIAS controls the gain of the circuit.

The Red output from pin 40 of 7600 is buffered by 7700 and 7701. The R-BIAS controls the gain of the circuit.

The drive of the Red and Green outputs is compared with the Blue drive by 7900-A. The difference signal is fed back to 7600 via the ABL line. If the Blue CRT is driven harder than the Green and Red CRTs, the inverting input on pin 2 will become greater than the non-inverting input on pin 3, resulting in the output on pin 1 to go Low. The ABL line will go Low, causing 7600 to reduce the drive to all of the CRTs. This circuit prevents the Blue tube from being over-driven.

9.3.18 HOP Analogue Control

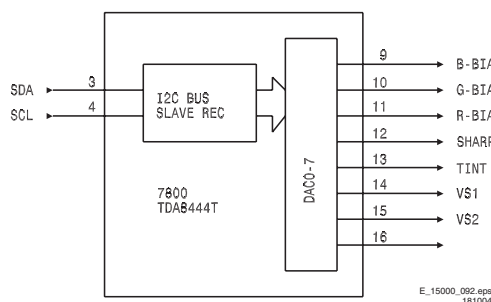


Figure 9-25 IC7800 HOP analogue control

IC 7800 develops the analogue control voltage for the HOP panel. The I2C bus controls the IC. This IC is located on the HOP panel.

9.3.19 CRT Panel

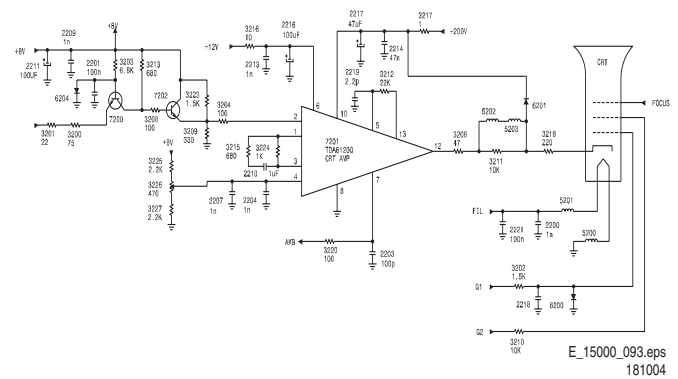


Figure 9-26 RGB amplifiers on CRT panel

The Red, Green, and Blue signals from the HOP panel are fed to their respective CRT panel. The signal is fed to the emitter of 7200 and then to 7202 on each panel. The output of 7202 is fed to pin 2 of 7201, which drives the cathode of the CRT. The AKB drive is output on pin 7 and fed to the HOP panel.

9.3.20 HOP Sync Switching and Processing

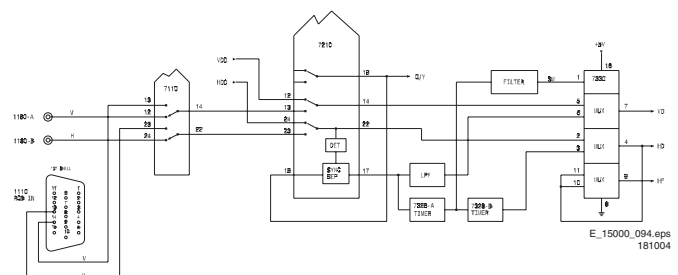


Figure 9-27 HOP sync processing

Horizontal and Vertical Sync from the SSB is fed to the HOP panel via the SSM panel, when NTSC is used as the signal source. In sets with the D Shell RGB input, 7110 switches between the Vertical and Horizontal Sync on the cinch connectors or the Sync from Pins 13 and 14 of the D Shell connector. IC 7210 selects between the output of 7110 and the Sync from the SSB. For separate Horizontal and Vertical Sync, the output of 7210 is fed to the multiplexer IC 7330, which is used as a switch. In the case of Sync on Y or Sync on Green, pin 19 of 7210 is fed to pin 18 of 7210 to a Sync Separator. If separate Horizontal Sync is present, the internal detector in 7210 turns the Sync Separator "off". The Sync output on pin 17 is fed to a Low Pass Filter, which separates the Vertical Sync. The Timer IC 7328 detects the Horizontal Sync and feeds it to 7330. The detected Horizontal Sync from 7328 is fed to pin 1 of 7330 to switch the IC to the pin 6 and 3 inputs.

9.3.21 Line Output

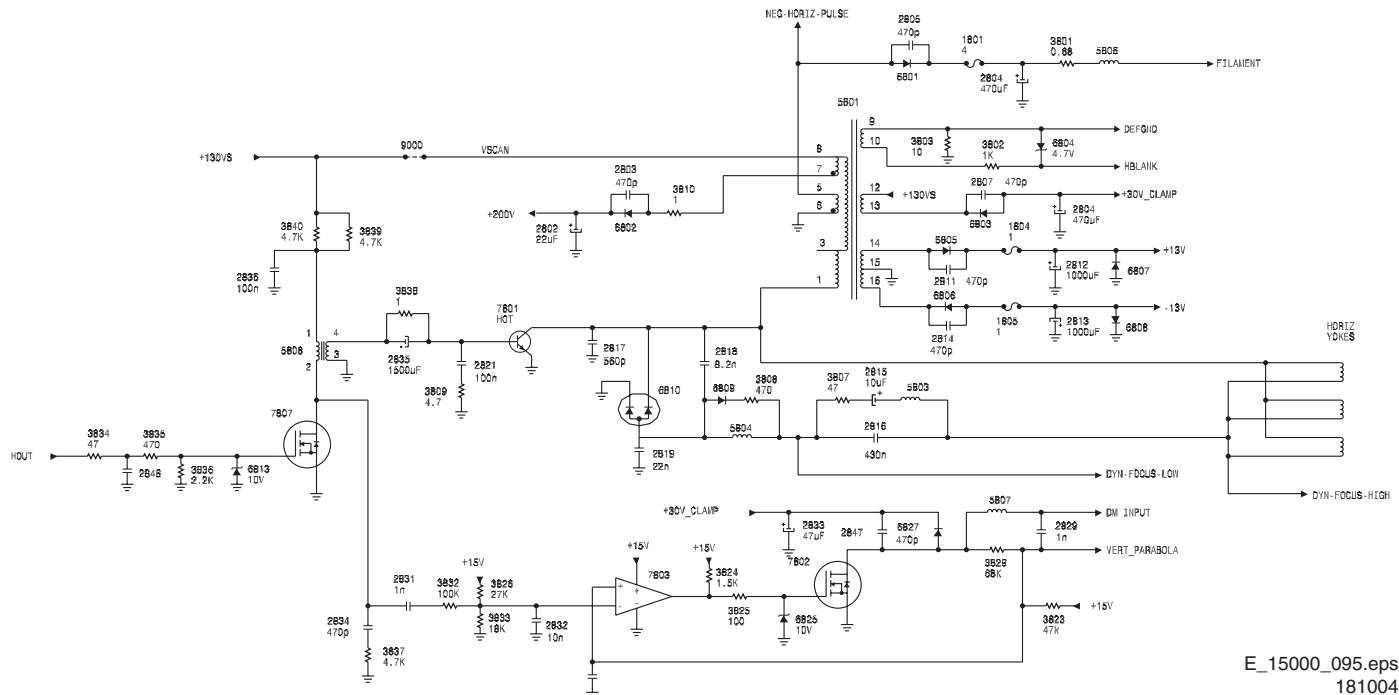


Figure 9-28 Line output circuit

Horizontal drive from the HOP panel is fed to 7807 on the Large Signal panel. Transistor 7807 drives the Horizontal Output Transistor 7801, which drives the Yokes and the Horizontal Output Transformer 5801. Transformer 5801 produces plus and minus 13-Volt supplies for the Vertical Output circuit. It also produces a 200-Volt source and Filament voltage for the CRT panels. The output of 7807 also drives 7803 and 7802, which drives the Dynamic Focus circuit.

9.3.22 Frame Amplifier

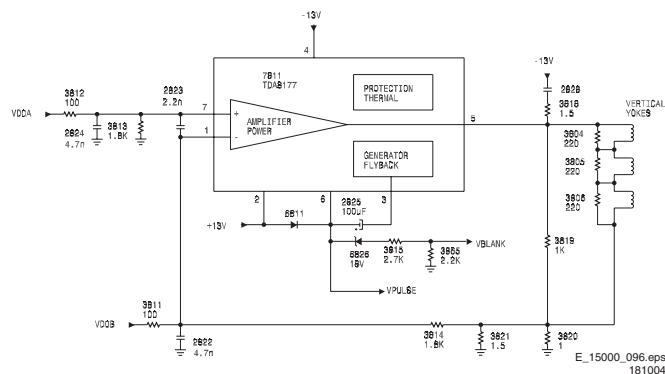


Figure 9-29 Frame circuit

The Vertical drive from the HOP panel drives the Vertical Output IC 7811. This IC is located on the Large Signal panel. Drive is fed to pin 7 and is output on pin 5 to drive the three Vertical Yokes. This IC is powered by the plus and minus 13-Volt supplies from the Horizontal Output circuit. A Vertical pulse on pin 6 is fed to the sweep failure detection circuit. If there is a failure in the Horizontal or Vertical sweep, the High Voltage will be shut down.

9.3.23 High Voltage Circuit

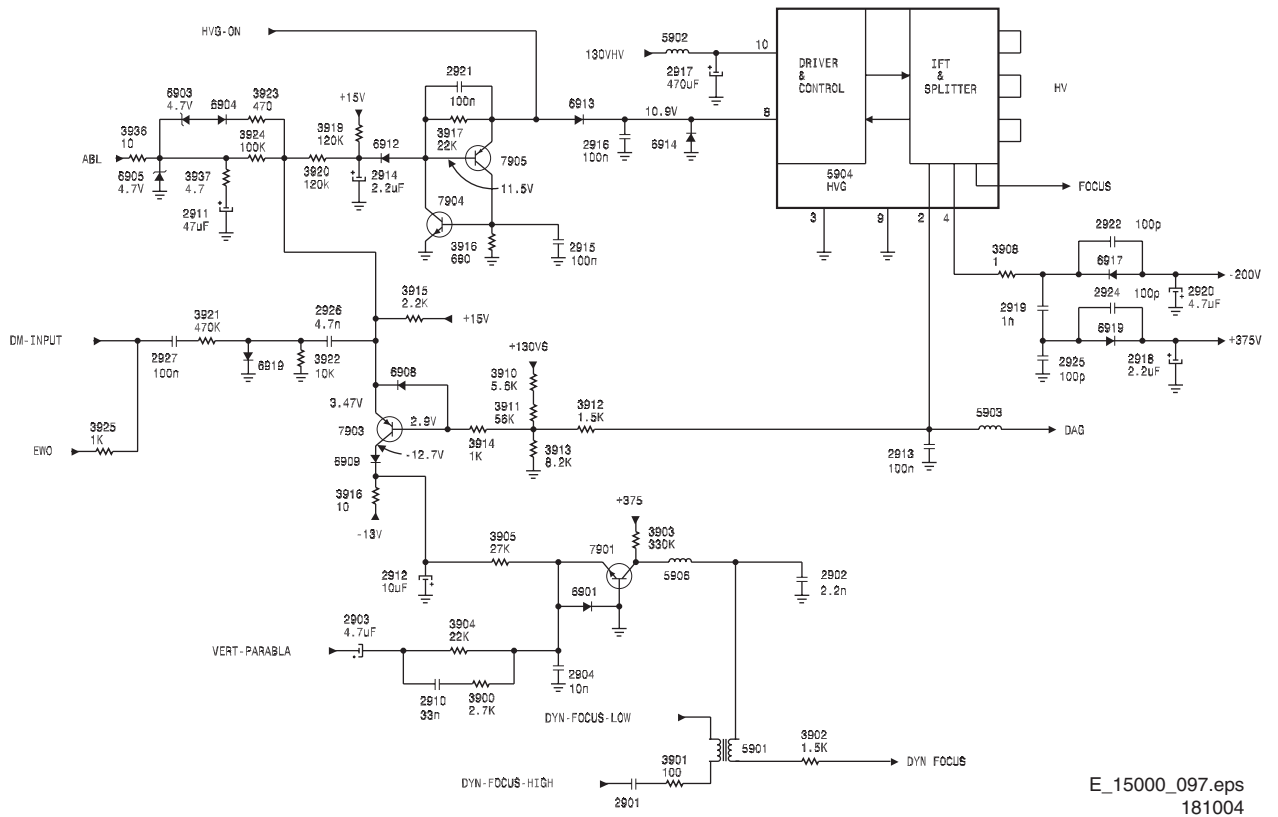


Figure 9-30 High voltage circuit

The High Voltage module is an integrated High Voltage supply with its own switching power supply. When the set is turned "on", 11.5 volts from the Sweep Failure detection circuit is fed to diode 6913 and to pin 8 of the High Voltage module. A supply voltage of 130 volts is also fed to pin 10 of the module. The Module then outputs High voltage to the three CRTs. It also outputs Focus voltage to the Focus G2 block. Output on pin 4 is rectified by 6917 to produce a negative 200 Volt source for the CRT G1 voltage. The voltage is also rectified by 6919 to

produce a 375 Volt source for the Dynamic Focus drive. The DAG line along with the output on pin 2 is connected to 7903 to produce the ABL voltage for the set. If an over-current condition should develop with the drive, the ABL voltage will go Low, turning 7905 "on", latching 7904, which will remove drive to pin 8 of the HVG. This will cause the High voltage to shut "off". Vertical Parabola drive is fed to 7901 to produce the Vertical component of the Dynamic Focus drive.

9.3.24 Shutdown

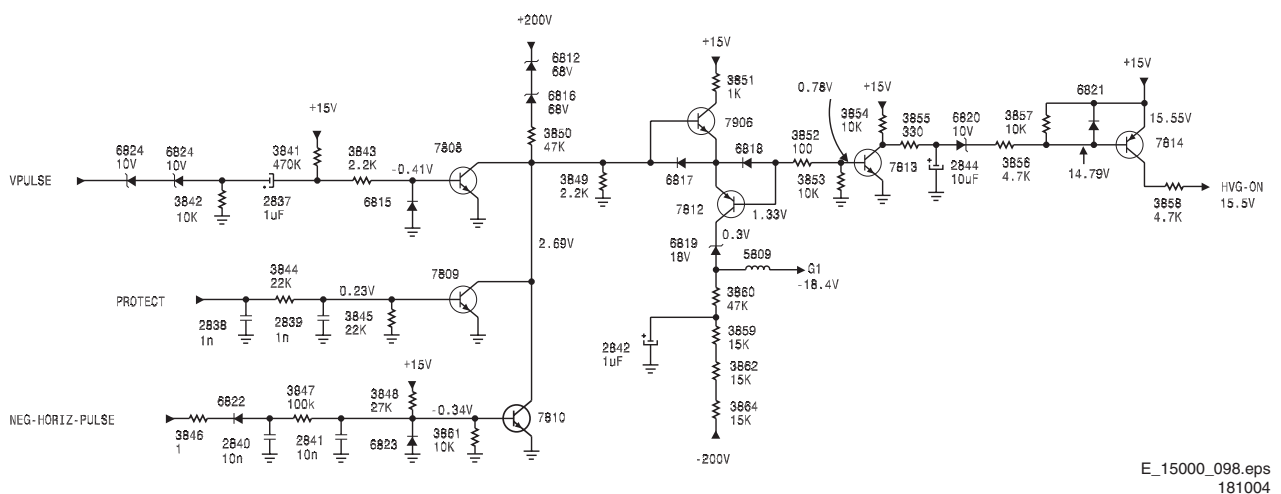


Figure 9-31 Blanking and HV-protection circuit

The Shutdown circuit will shut the High voltage "off" if the Horizontal or Vertical Sweep should fail. It will also shut the High voltage "off" if the Power Fail line goes "high" or the +200 Volt source should fail.

The Vertical pulse is fed to zener diodes 6824 and 6814, which keeps capacitor 2837 charged. This pulse is rectified by 6815 to keep the base of 7808 at a negative voltage. This keeps the

transistor turned "off". In the same manner, the Negative Horizontal pulses keep the base of 7810 at a negative voltage to keep it turned "off". The Protect line is normally Low, keeping 7809 turned "off". The +200-volt source is fed through zener diodes 6812 and 6816, resistor 3850, the base-emitter of 7906, the base emitter of 7812 to keep transistor 7813 turned "on". This turns transistor 7814 "on", which switches the "on" voltage to the High Voltage module. The conduction of 7812 keeps the voltage on the G1 line at approximately - 18 Volts, which turns the CRTs "on". If the Vertical Pulse should fail, transistor 7808 will turn "on", which will turn 7906, 7812, 7813, and 7814 "off". This will turn the HVG module "off". In addition when 7812 turns "off", the G1 voltage will go to -200 Volts, blanking the CRTs. The same sequence will occur if Horizontal should fail, the Protect line should go "high", or the +200 Volt source should fail.

9.3.25 Convergence

The Convergence system is split into two sections. The convergence signal processor is located on the ACS (Auto Convergence System) module. The output amplifiers are located on the SSM (Small Signal Module).

Convergence processor

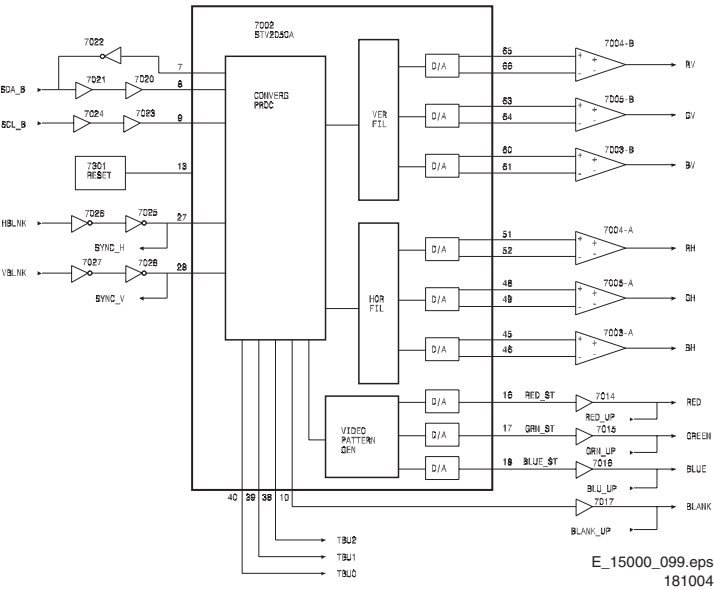


Figure 9-32 Convergence signal processor

The Convergence data is stored in the EEPROM, 7000. The microprocessor located on the ASC module reads 1,971 bytes of data from 7000 and writes it to the Convergence Processor, 7002. Horizontal sync is inverted by 7026, buffered by 7025, and fed to pin 27 of 7002. Vertical sync is inverted by 7027, buffered by 7028, and fed to pin 28 of 7002. The data is processed to produce the desired convergence correction waveforms, which are output on six DACs. During the convergence adjustment procedure, a 180-point alignment grid is output on Pins 16, 17, and 18. This signal is mixed with the OSD to be displayed on the screen. In the 4x3 aspect ratio set, there are three sets of convergence data. In sets with a 16x9 aspect ratio, there are two sets of convergence data. The set will require convergence alignment for each set of convergence data. The correct mode must be selected and the signal for that mode must be applied to the set during the convergence alignment. The output of the DACs is fed to six op-amps before being fed to the Power Amplifiers located on the SSM. When screen centring is being performed, it is necessary to disable the convergence drive waveform. A High on pin 77 turns transistor 7029 "on", turning 7038 "on", which turns transistors 7032, 7033, 7030, 7031, 7034, and 7035 "on". This mutes the correction drive signal to the Power Amplifiers.

Convergence Horizontal Output

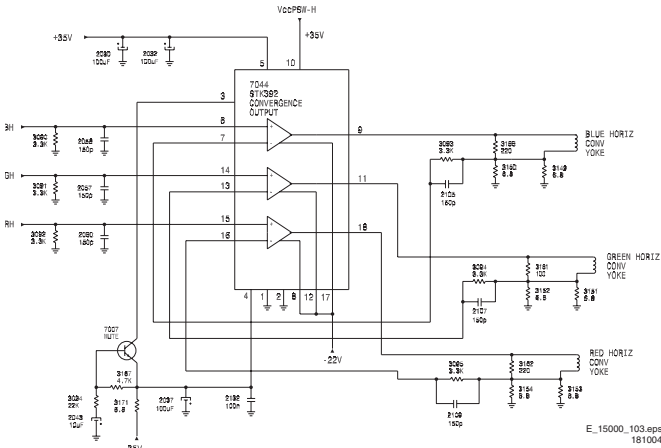


Figure 9-33 Convergence horizontal output circuit

IC 7044 amplifies the Horizontal convergence waveforms. The correction waveforms are fed to the IC on Pins 6, 14, and 15. They are output to the Convergence Yokes on Pins 9, 11, and 18. The IC is powered by four supply inputs. A +35 Volt supply is fed to pin 5, a -35 Volt supply is fed to pin 4, and a -22 Volt supply is fed to pin 8, 12, and 17. The supply fed to pin 10 is normally a +22 Volt supply. During signal peak drives, the voltage on pin 10 is increased to +35 Volts. Feedback sense voltage is developed across the 6.8 ohm resistors on the return side of each yoke. Transistor 7007 is part of a Soft Start circuit. When the set is turned "on", Transistor 7007 turns "on" until capacitor 2043 is fully charged. While 7007 is being turned "on", a negative voltage is placed on pin 3 muting the output of the IC. A 220-ohm snubber resistor is across each of the yoke windings. This resistor will overheat if the unit is operated with the Convergence Yokes unplugged.

Convergence Vertical Output

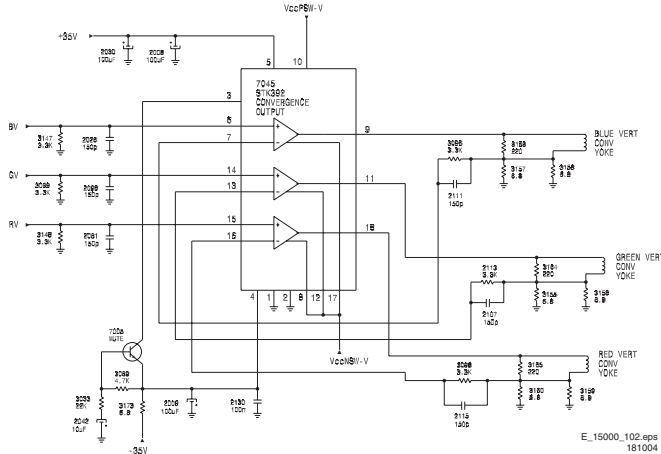


Figure 9-34 Convergence vertical output circuit

IC 7045 amplifies the Vertical convergence waveforms. The correction waveforms are fed to the IC on Pins 6, 14, and 15. Output is on Pins 9, 11, and 18 to the Vertical Convergence yokes. Feedback sense voltage is developed across the 6.8-ohm resistors on the return side of each yoke. A Snubber resistor is across each yoke. These resistors will overheat if the circuit is operated without the Convergence Yokes being plugged in. The IC is powered by four supplies, +35 Volt, -35 Volt, VccPSW-V, and VCCNSW-V. The VccPSW-V supply is normally at +22 volts. The BV_OUT, GV_OUT, and RV_OUT lines are connected to a Vertical Power up circuit, which senses the drive to the Convergence Yokes. If the drive to the yokes reaches 10 to 12 Volts, the Vertical Power up circuit will switch the VccPSW-V supply to +35 Volts. If the Vertical Power

up circuit senses a negative 10 to 12 volt drive to the Vertical Convergence yokes, the VccNSW-V supply will switch from -22 Volts to -35 Volts. As with the Horizontal drive circuit, 7005 mutes the output of 7045 during power up.

9.4 Audio

9.4.1 Overall Audio Block

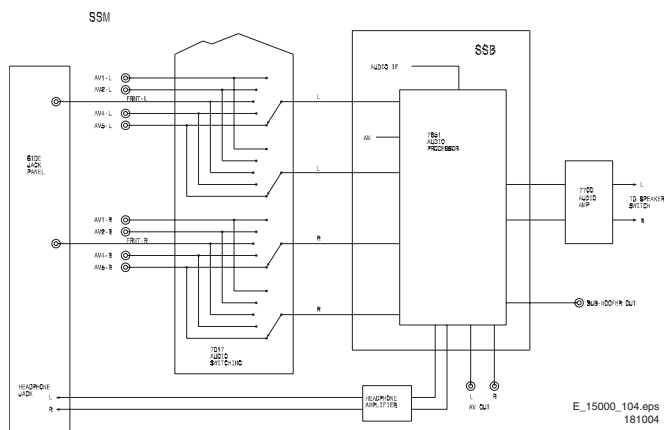


Figure 9-35 Overall Audio Block

IC 7017, located on the SSM, selects Left and Right channels of audio and feeds them to the Audio Processor, 7651, located on the SSB panel. The Audio processor selects between the two audio channels from the SSM or internally decoded audio from selected audio IF on the SSB. The Processor outputs line level Left and Right monitor audio, and line level Sub Woofer out. These jacks are located on the SSM. It also outputs Left and Right audio to the Audio Amplifier, located on the SSM.

9.4.3 Audio Amplifier

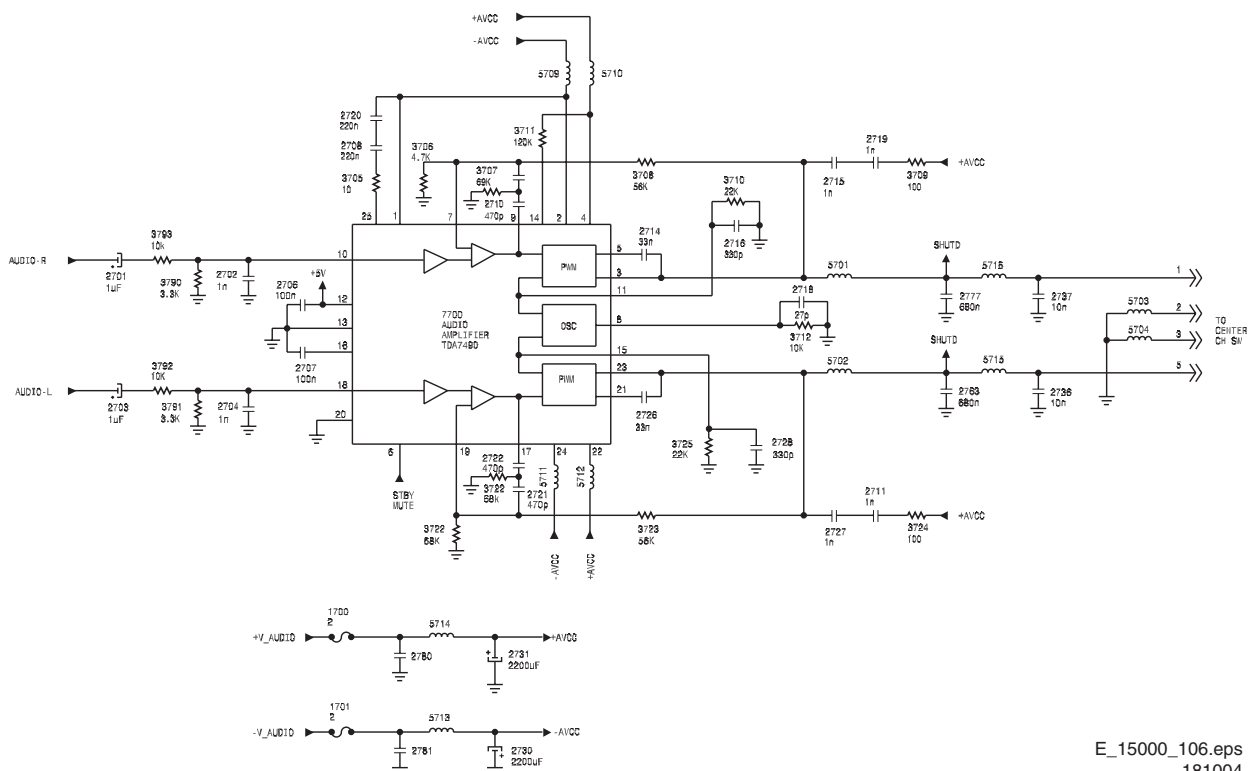


Figure 9-37 Audio Amplifier

Left and Right audio is output to a Headphone Amplifier located on the SSM. The output of the Headphone Amplifier is fed to the Side Jack Panel.

9.4.2 Audio Processor

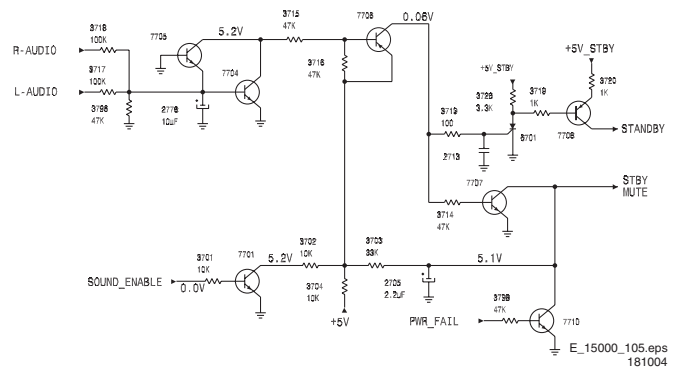


Figure 9-36 Audio Processor

Audio processing is performed by 7651, which is located on the SSB. QSS Audio IF is fed to pin 50 of the IC. If the RF signal source is SECAM, the AM audio is fed to pin 47. Selected AV audio is fed to Pins 42, 41, 45, and 44. The Demodulator detects and decodes the signal before feeding it to the processing section. The selected AV audio is fed to two A/D converters and then to the processing section. The Sound processing includes Volume, Equalizer, balance, Loudness, Incredible Sound, and Virtual Dolby. After processing, the Audio signal is fed to six D/A converters. The Main Speaker Audio is output on Pins 20 and 21. Headphone Audio is output on Pins 17 and 18 before being fed to an amplifier on the SSM. AV out Audio is output on Pins 25 and 26.

The Audio Amplifier is located on the SSM. The output power for the Audio Amplifier is 10 Watts per channel for the Basic and Basic Plus versions. The Core Version has an output of 15 Watts per channel. IC 7700 is the Audio output IC. This is a class D amplifier. Left and Right Audio from the SSB is fed to Pins 10 and 18 of the IC. The output stages are basically switch mode circuits, driven by the audio input signal. The frequency of the output is kept at 200 kHz by an internal 200 kHz oscillator. The pulse width of the output is determined by the signal level of the input signal. The Right Channel pulse width signal is output on pin 3. The output is filtered by 5701, 2777, 2776, 2717, 5716, and 2737. The amplified audio is output on connection 1349. In the same manner, Left audio is output on pin 23. The IC is powered by +19 and -19 Volt supplies. The supplies are protected by fuses 1700 and 1701. The Supply voltage for the Core version is 4 volts higher than the Basic and Basic plus version. The extra supply voltage is needed to produce the additional 5 Watts per channel output.

Muting and volume control for the audio takes place in the Audio Signal processor on the SSB. The STBY MUTE line on pin 6 goes to 2.5 Volts to mute the audio when the set is turned "on" or "off". This line goes "low" to place the amplifier in a Standby mode if a DC voltage is detected on the Audio Output lines

9.4.4 Shutdown Mute

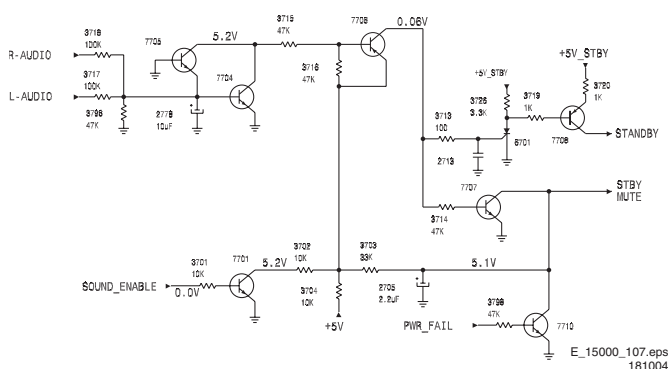


Figure 9-38 Shutdown Mute

The Audio Amplifier will be placed in a Standby mode and the set will shut down if a DC voltage is detected on the Speaker Output lines. The Left and Right audio output lines are connected to the base of 7704 and the emitter of 7705 via resistors 3718 and 3717. Filter capacitor 2778 filters out the AC component of the waveform. If the DC voltage goes positive, 7704 will turn "on". If the voltage goes negative, 7705 will turn "on". This turns 7706 "on" which turns 7707 "on". This causes the Front Detect line to go Low, preventing the microprocessor from receiving any commands. It also turns SCR 6701 "on", turning transistor 7708 "on", causing the Standby line to go "high". If this SCR is turned "on", it will be necessary to remove power from the set to reset the circuit. This will turn the set "off". Transistor 7707 also turns "on", causing the Standby-Mute line to go Low. This places the Audio Output IC in a Standby mode.

9.5 Control/OSD

9.5.1 Microprocessor

The HDR2K3 has two microprocessors. The microprocessor, OTC, located on the SSB, 7001, is the main processor for the set. When Power is applied to the set and the Mains switch is turned "on", the processor monitors the Keyboard and IR receiver located on the Sensor Board. This IC controls the functions on the SSB, Video switching on the SSM, and the PIP/DW panel. A ROM located inside the IC has the Startup program. The main program to run the processors is located in

If the Power Fail line should go "high", 7710 will turn "on", causing the Standby-Mute line to go Low.

9.4.5 Centre Channel Amp Switch

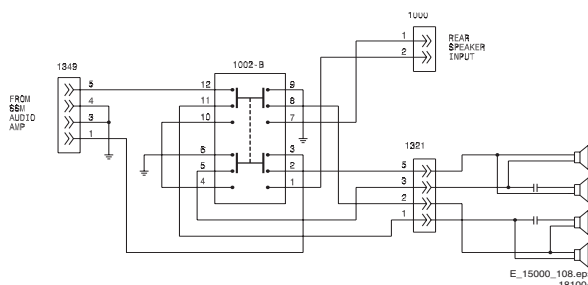


Figure 9-39 Centre Channel Amp Switch

The Core versions have a Centre Channel amp switch, located on the rear of the set. The Output of the Audio Amplifier on the Basic and Basic Plus versions are fed directly to the speakers. In the Core sets, the Output is fed to the Centre Channel amp switch before being fed to the speakers. When the Centre Channel amp switch is placed in the External position, the Left and Right speakers in the set are placed in series with the external speaker input. In cases where the Customer has a separate sound system, this switch allows the speakers in the set to be used as the centre output.

9.4.6 Headphone Amplifier

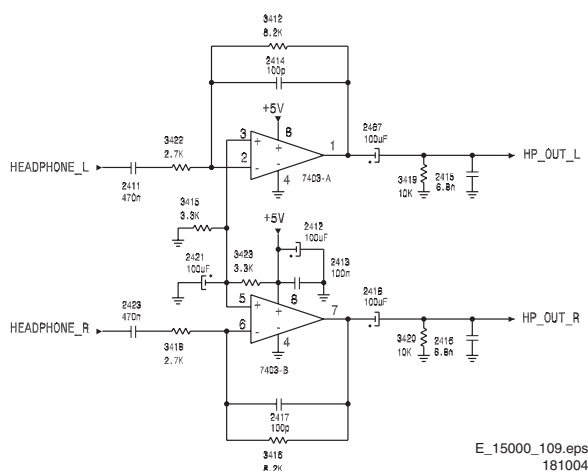


Figure 9-40 Headphone Amplifier

IC 7403 is the Amplifier for the Headphone output. The volume control for the Headphone output is on the Audio Signal processor located on the SSB. The Headphone Amplifier is located on the SSM. The output of the amplifier on Pins 1 and 7 is sent to the Headphone Jack, located on the Side Jack panel.

the Program Flash RAM, 7006. IC 7012 is used by the OTC for temporary storage. IC 7007 is used to store data for Teletext. There are three I2C busses, a fast bus, F, a slow bus, S, and a TX bus to communicate with the microprocessor on the ACS module. The NVM 7011 stores settings such as customer preferences, OPT numbers, Tuner settings, and Error codes. composite video is fed to pin 5 for decoding Teletext and Closed Caption information. In the Standby mode, Power is not applied to the processor on the ACS module.

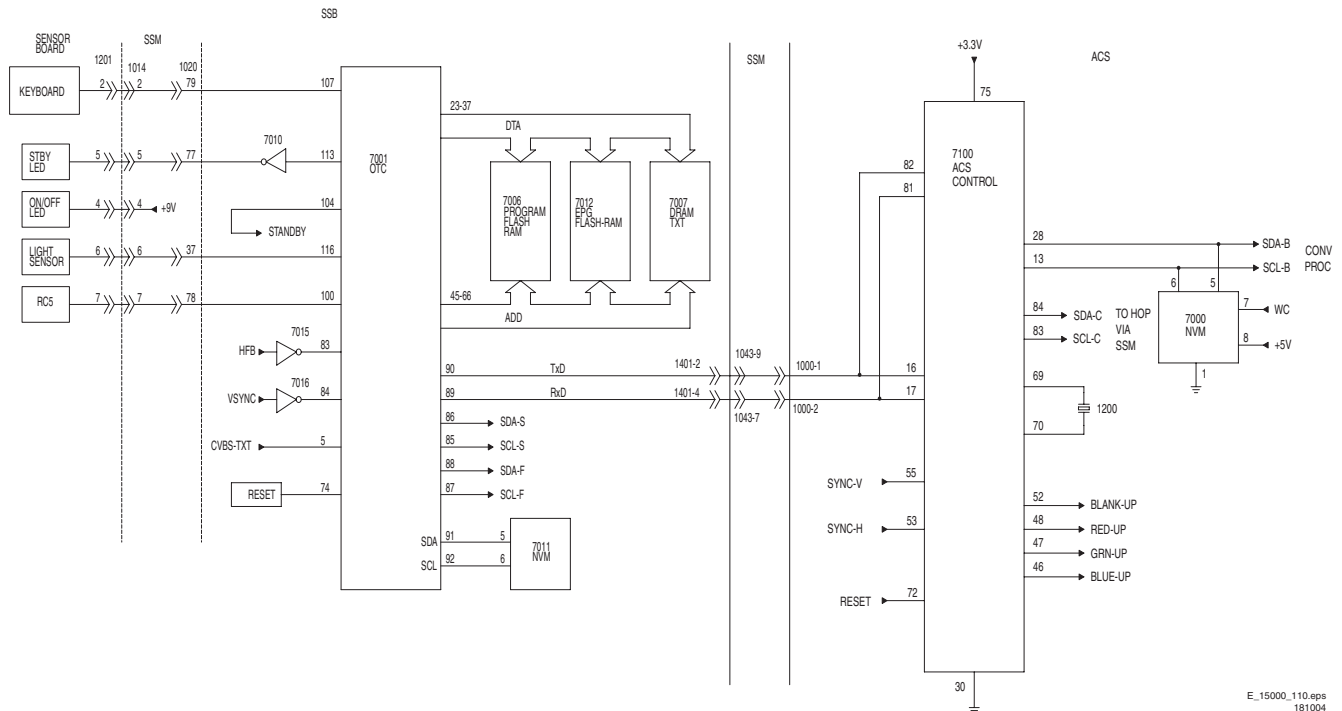


Figure 9-41 Microprocessor

The microprocessor, 7100, located on the ACS module, controls the Convergence, Geometry, and CRT drive circuits. Settings for Convergence, Geometry, and White drive are stored in the NVM, 7000. This IC is 512K for the AP sets and 256K for the Korean version. When 7100 reads the size of 7000, it then determines which software to load. If it reads 512K present, the AP software is loaded. If it reads 256K, NTSC only software is loaded. Commands for the ACS processor are produced by the OTC on the SSB and transmitted via the TXD and RXD lines.

9.5.2 Front Control Panel

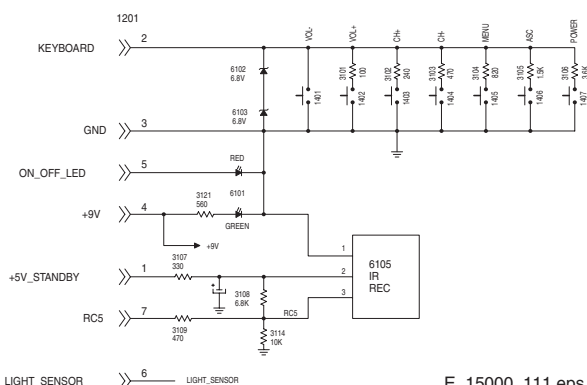


Figure 9-42 Front Control Panel

The Front Control panel has the Power LED, Keyboard, IR Receiver, and Light Sensor. The Keyboard is a resistor ladder. The voltage changes value depending on which selection is made. The voltage on this line will be 3.3 volts if no buttons are selected. The two-colour LED indicates the status of the set. In the Standby mode, the ON_OFF_LED line is High and the +9-volt source is turned "off". In this case, the RED LED is lit. When the set is turned "on", the +9-volt source is switched "on", turning the Green section of the LED "on". The LED then turns Yellow. When the set is fully "on", the ON_OFF_LED line goes Low, turning the Red LED "off". The indicator is now Green.

The IR Receiver, 6105, receives commands from the remote control.

9.5.3 Light Sensor

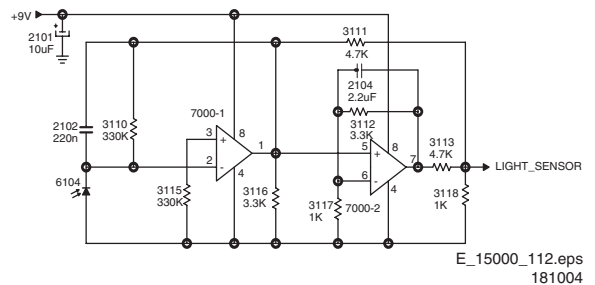


Figure 9-43 Light Sensor

The Light Sensor, 6104, is amplified by two op amps in 7000. This circuit senses the ambient light and outputs a voltage on pin 7 of 7000. This voltage is fed to the OTC, which makes changes in the picture brightness to compensate for changes in the ambient light.

9.5.4 I2C interconnect

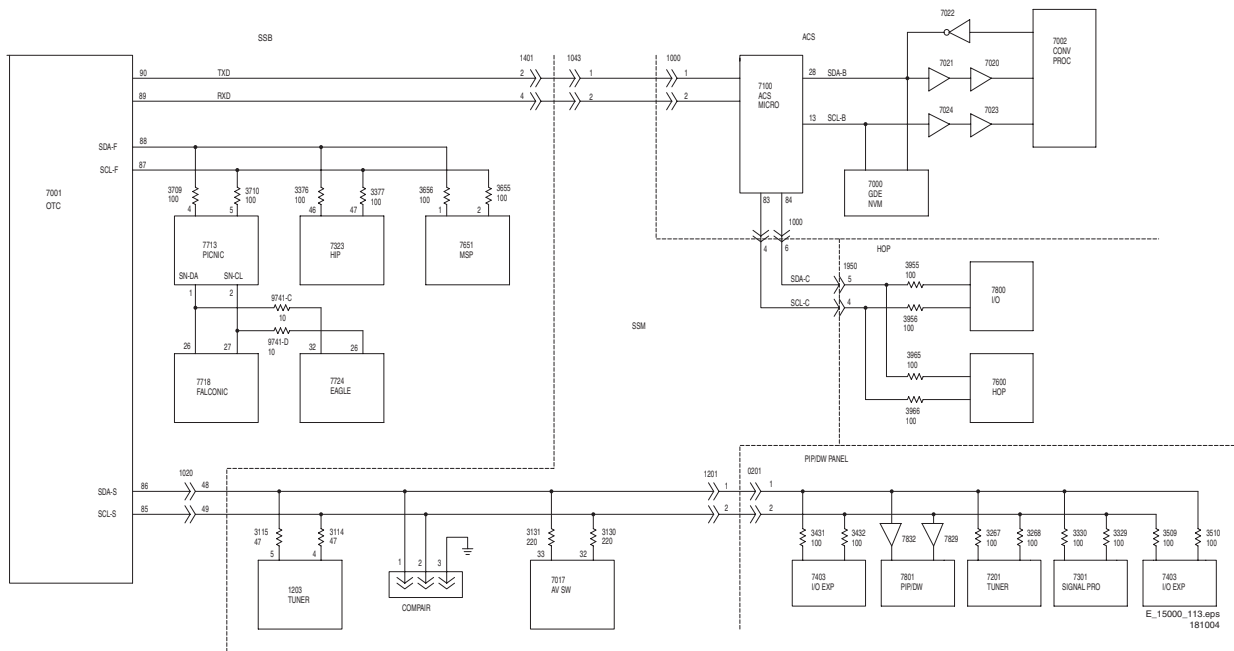


Figure 9-44 I2C interconnect

The OTC communicates with the set via three I2C busses. SDA-F, Fast bus communicates with the PICNIC, HIP, and MSP (Audio Processor). The SN-DA line from the PICNIC communicates with the FALCONIC and EAGLE. The SDA-S Slow bus communicates with the Tuner, AV Switch, and ComPair connector on the SSM. It also communicates with the PIP-DW board.

The TXD and RXD lines communicate with the microprocessor on the ACS module. The microprocessor on the ACS communicates with the GDE NVM, Convergence Processor, and the HOP panel.

In the SAM (Service Alignment Mode), the menus are generated by 7001, except those in the GDE SAM. The GDE SAM menus are generated by IC 7100 on the ACS module.

The Convergence Alignment menus are generated by 7100, while the Convergence Alignment grid is generated by IC 7002. The OSD signals from 7001 on the SSB are fed to the SSM (Small Signal Module) via connector 1002 and 1043. The OSD signals from the Convergence Processor, 7002, are buffered by 7014 through 7017 before being mixed with the signals from the ACS microprocessor, 7100. They are fed to the SSM via connector 1000. The signals from the ACS and SSB are mixed and fed to the HOP panel and HOP IC, 7600, via connector 1610. The HOP IC, 7600, mixes the OSD signal with the video signal before feeding it to the CRTs.

9.5.5 On-Screen Display

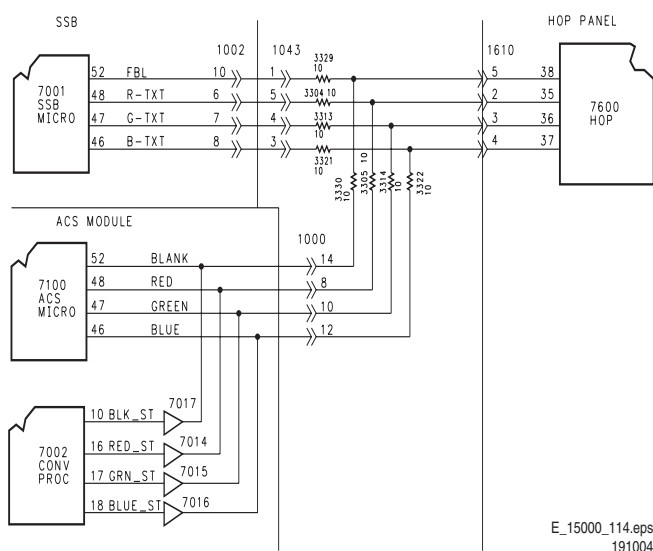


Figure 9-45 On-Screen Display

Signal for the OSD (On-Screen Display) comes from three different sources. IC 7001, which is located on the SSB (Small Signal Board), generates all of the customer menus except for Convergence.

9.6 List of Abbreviations

16:9-ARFRONT	16:9 aspect ratio input from side jack panel	DAC-HOP	Digital analogue converter HOP IC
50Hz/60Hz	50Hz/60Hz AC frequency	DC_PROT/	DC protection (for supply)
6-CHANNEL DAC	6-Channel DAC	AUDIO_SR	Filament supply voltage
ACS	Auto Convergence System	DC-filament	DC protection
AFC	Automatic Frequency Control	DC-PROT	Detect signal side I/O (side jack panel) input
AGC	Automatic Gain Control	DETECT	Directions For Use: owner's manual
AM-FM	Amplitude Modulation/Frequency Modulation	DFU	Digital In 1
AM-SOUND	Amplitude modulated sound signal	DIG_IN1	Digital In 2
AP	Asia Pacific	DIG_IN2	Digital in/out
AR	Aspect Ratio: 4 by 3 or 16 by 9	DIGITAL I/O	Digital out
ATV	See Auto TV	DIG-OUT	Monochrome TV system. Sound carrier distance is 6.5 MHz
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way	D/K	Dynamic Noise Reduction
AUDIO_C	Audio Centre	DNR	Dual Sound Audio Left
AUDIO_L	Audio Left	DS-AUDIO-L	Dual Sound Audio Right
AUDIO_R	Audio Right	DS-AUDIO-R	Digital Signal Processing
AUDIO_SL	Audio surround Left	DSP	Dealer Service Tool: special remote control designed for service technicians
AUDIO_SW	Audio Subwoofer	DST	DUET-IC
AUDIO-L-PROC	Audio left processed	DUET	Digital Versatile Disc
AUDIO-R-PROC	Audio right processed	DVD	Dynamic phase correction
AUDIO-SR	Audio surround right	DYN-FASE-COR	Feature box IC performing peaking, zooming and sub pixel LTI in both horizontal and vertical directions, CTI, and other colour features
AUX-SUPPLY	Auxiliary supply	Eagle	Extra high-tension information
BC-PROT	Beam current protection	EHT-INFO	Electronic Program Guide (= NexTVIEW)
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz	EPG	East-west drive signal
BLC-INFO	Black current information	EW-DRIVE	Field and line rate converter IC.
B-SC1-IN	Blue SCART1 in	FALCONIC	SAA4992H, feature box IC which performs Digital Natural Motion, 3DNR vertical zoom, and vertical peaking
B-SC2-IN	Blue SCART2 in	FBCSO	Fixed beam current switch off
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries	FBL-DS-OUT	Fast Blanking Dual Screen out
B-TXT	Blue teletext	FBL-FDS	Fast Blanking Full Dual Screen
B-vc	Blue from video-controller	FBL-PIP	Fast Blanking PIP
C	Centre	FBL-SC1-IN	Fast blanking signal for SCART1 in
C/16/9	Chrominance input	FBL-SC2-IN	Fast blanking signal for SCART2 in
C-7-OUT	Chrominance on pin 7 SCART (variant)	FBL-TXT	Fast Blanking Teletext
CBA	Circuit Board Assembly	FDS	Full Dual Screen (same as FDW)
CENTER	Centre speaker	FDSL-OUT	Full Dual Screen - Left out
C-FRONT	Chrominance front input	FDSR-OUT	Full Dual Screen - Right out
CL_DS_L	Constant Level Dual Screen Left	FDW	Full Dual Window (same as FDS)
CL_DS_R	Constant Level Dual Screen Right	FEAT-U	U from Feature Box
CL_L	Constant Level Left	FEAT-V	V from Feature Box
CL_L_OUT	Constant Level Left out	FEAT-Y	Y from Feature Box
CL_R	Constant Level Right	FILAMENT	Filament of CRT
CL-R-OUT	Constant Level Right out	FILAMENT-PROT	Filament protection
CODEC	Coding/Decoding	FLASH	Flash memory
COMP	Compander ON/OFF	FM	Field Memory or Frequency Modulation
CORDL_L	Cordless Left	FM SOUND	Frequency Modulation Sound
CORDL_R	Cordless Right	FRAME ROTATION	Frame rotation
CORE TOP LEVEL	Core Top Level	FRAME-ROT +	Frame rotation plus
CRT	Cathode Ray Tube	FRONT-C	Front input chrominance (SVHS)
CSM	Customer Service Mode	FRONT-DETECT	Front input detection
C-UI	Chrominance UI	FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)
CVBS	Composite Video Blanking Signal	GDE	Generic Display Engine
CVBS_Y-UI	CVBS Y UI	GHOST-IN	Signal Ghost cancellation in
CVBS-PIP-DS	CVBS Picture In Picture dual Screen	G-SC1-IN	Green SCART1 in
CVBS-SC1-IN	CVBS SCART1 in	G-SC2-IN	Green SCART2 in
CVBS-SC2 OUT	CVBS SCART2 out	G-TXT	Green teletext
CVBS-SC2-IN	CVBS SCART2 in	G-vc	Green from video-controller
CVBS-SC3-IN	CVBS SCART3 in	HA	Horizontal Acquisition
CVBS-SC4-IN	CVBS SCART4 in	HA1	Horizontal Sync (diversity)
CVBS-TER	CVBS terrestrial	HA-D	Horizontal Sync from HIP-IC to FDS
CVBS-TXT-DS-OUT	CBVBS teletext Dual Screen out	HD	Horizontal drive coming from PICNIC
CVBS-TXT-OUT	CVBS teletext out	Hdefl-1in	Horizontal deflection signal needed for DC-shift circuitry
CVBS-Y-FRONT	CVBS luminance front input	Hdefl-lin	Horizontal deflection linearity

HEATER	Heater (Filament)	NTSC	National Television Standard Committee. Colour system mainly used in North America and Japan. Colour carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
HFB	Horizontal flyback	NVM	Non-Volatile Memory
HFB+13V	Non-rectified output 13V-winding LOT	O/C	Open Circuit
HFB-D	Horizontal flyback to FDS	ON/OFF LED	On/off control signal for the LED
HIP	High-end Input Processor	OSD	On Screen Display
HOP	High-end Output Processor	OTC	OSD, Teletext Controller
HOSD PIP	Horizontal OSD PIP	OUT-1	Y-output POPOV (Double Window PIP IC)
HP	Headphone	OUT-2	V-output POPOV (Double Window PIP IC)
HS-DS	Horizontal sync input POPOV (Double Window PIP IC)	OUT-3	U-output POPOV (Double Window PIP IC)
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	OVERRULE-TXT	Overrule Teletext
I2C	Integrated IC bus	P50_OUT	Easy link data line from SCART2
I2S	Integrated IC Sound bus	PAL	Phase Alternating Line. Colour system mainly used in West Europe (colour carrier= 4.433619 MHz) and South America (colour carrier PAL M= 3.575612 MHz and PAL N= 3.582056 MHz)
I2S-CL	I2S bus clock	PCB	Printed Circuit Board (CBA)
I2S-DSP-IN	I2S digital signal processor in	PD	Power Down
I2S-DSP-OUT	I2S digital signal processor out	PICNIC	Picture Improved Combined Network IC
I2S-DSP-OUT1	Serial-DSP-bus-out1	PILOT	Pilot Signal
I2S-WS	I2S bus Word Stroke	PILOTMUTE	Pilot Mute signal
IN-C_IN-R-SC2	Either Chrominance-in SCART2 or Red-in SCART pin 15	PIP	Picture In Picture
IN-FRONT-SNDL	Sound left front in	PIP-B	Picture In picture Blue
IN-FRONT-SNDR	Sound right front in	PIP-FBL	PIP Fast Blanking
IN-SC1-B	In SCART1 blue	PIP-G	Picture In Picture Green
IN-SC1-G	In SCART1 green	PIP-R	Picture In Picture Red
IN-SC1-R	In SCART1 red	PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
IN-SC1-SNDL	In SCART1 sound left	POPOV	Double Window PIP IC
IN-SC1-SNDR	In SCART1 sound right	POR	Power On Reset, signal to reset the P
IN-SC2-B	In SCART2 blue	Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
IN-SC2-CVBS_Y	In SCART2 CVBS or luminance (SVHS)	POWER-DOWN	Power Down Mute
IN-SC2-FBL	In SCART2 fast blanking	MUTE	Power "on" Mute
IN-SC2-G	In SCART2 green	POWER-ON MUTE	Right Audio
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.	RAM	Random Access Memory
IN-UI-B	B input from UI	RC5	RC5 signal from the remote control receiver
IN-UI-FBL	Fast Blanking input from UI	RESET	Reset signal
IN-UI-G	G input from UI	RESET-AUDIO	Reset signal for audio IC MSP3410
IN-UI-R	R input from UI	RESET-AUDIO-INV	Reset signal for audio IC MSP3410 inverted
IO-BUS	In/out - Bus	RESET-FLASH	Reset signal flash memory
IR-LED	Drive signal for the service infrared LED	RF	Right output (no companding)
KEYBOARD	Top controls	ROM	Read "on"ly Memory
L	Left Audio	R-SC1-IN	Red SCART1 in
LDP	Line Deflection Protection	R-TXT	Red teletext
LED	Light Emitting Diode	R-VC	Red from video-controller
LINE-DRIVE	Line drive signal	S/C	Short Circuit
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I	SAM	Service Alignment Mode
LMN	System L, M, N	SC2-B-IN	SCART2 blue in
LNA	Low noise adapter	SC2-C-IN	SCART2 chrominance in
LS CORRECTION	Picture with corrections	SC2FH_IFH	Sandcastle 1fH/2fH
LSB	Large Signal Board	SC2-G-IN	SCART2 green in
LV-	Frame coil sink signal to the N/S correction circuitry	SC2-R-IN C-IN	Red in SCART2 or chrominance in
LV+	Frame coil drive signal from the frame output stage	Scavem	Scan Velocity Modulation
MCADDEC_RESET	Reset signal (Master reset)	SCAVEM-SW	Scavem- switch
MCS-MPEG	Multi Channel Sound - MPEG	SCL	Serial Clock I2C
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz	SCL-F	Clock line of the I2C-bus fast (for TXT)
MSP-CLOCK	Clock signal multi-standard sound processor	SCL-S	Clock line of the I2C-bus slow
MUP	Microcomputer		
MUTE	Mute-Line		
N52502	CAD naming referring to other sub-schedule		
NC	Not Connected		
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.		

SDA	Serial Data I2C	STANDARD-FM-1	Standard Frequency Modulation 1
SDA-F	Data line of the I2C-bus fast (for TXT)	STANDARD-FM-2	Standard Frequency Modulation 2
SDA-S	Data line of the I2C-bus slow	STANDBY	Standby
SDM	Service Default Mode	STATUS1/2/3	Status signal from Euro-connector 1, 2 or 3 to the uP, signal (1.29-3.31V is 16:9 signal, 3.32-5.0V is 4:3 signal)
SECAM	SEquence Couleur Avec Memoire. Colour system mainly used in France and East Europe. Colour carriers= 4.406250 MHz and 4.250000 MHz	STBY	Standby
		STEREO	Stereo
SEL_SOFAC_0	Selection-signal for SOFAC 0	SUBCAR	Sub carrier
SEL_SOFAC_1	Selection-signal for SOFAC 1	SUB-H	Horizontal Sync Sub-TV-Program (via FDS)
SEL_TO-MCS_LR	Selection switch MCS Left Right		
SELECT TO EXT2	Selection of External 2 input	SUB-V	Vertical Sync Sub-TV-Program (via FDS)
SELECT_TO_CORDL_1	Selection signal for Cordless 1	SUBWOOFER	Subwoofer speaker
SELECT_TO_MCS_CINCH_0	Selection-signal for MCS Cinch 0	SURROUND-LEFT	Surround Left
SELECT_TO_MCS_CINCH_1	Selection-signal for MCS Cinch 1	SURROUND-RIGHT	Surround Right
SELECT-AUDIO		SW	Subwoofer
CINCH1	Selection of audio via cinch input 1	SYNC-SELECT	Synchronization selection
SELECT-AUDIO-CINCH2	Selection of audio via cinch input 2	TOPIC	The Outmost Picture Improvement IC
SELECT-AUDIO-LR	Selection of audio left and right	TRIG	Triggering
SELECT-TO_CORDL_0	Selection signal for Cordless 0	TUNED	Tuned-flag coming from the IF-IC TDA1597
SERVICE-DEFAULT	Service pin to activate SDM	UB-DEC	U-input for FDS
SERVICE-MODE	Service pin to activate SAM	U-DEC	U-dec (input signal for PICNIC)
SIF	Sound Intermediate frequency	U-DS-1FH	U Dual Screen 1 x Horizontal Frequency
SIFM	Sound intermediate frequency (Mono)	U-DS-2FH	U Dual Sound 2 x Horizontal Frequency
SL	Surround Left	U-DS-OUT	U Dual Screen out
SL-ST	Sliding stereo of the Stereo Demodulator IC TDA1578A	uP	Microprocessor
		UF-DEC	U-MAIN input POPOV (Double Window PIP IC)
SNDL-CL_VL-OUT	Sound left constant level -variable level out	U-FEAT	U-feature-box (output signal from PICNIC)
SNDL-CL-VL-OUT	Sound L constant level, variable level out	UF-SUB	U-SUB input POPOV (Double Window PIP IC)
SNDL-FRONT-IN	Sound left front in	UI	Universal Interface
SNDL-HEADPH-OUT	Sound left headphone out	U-OUT	U-signal to HOP IC
SNDL-SC1-IN	Sound left SCART1 in	U-SUB	U-output of HIP-IC on FDS
SNDL-SC1-OUT	Sound left SCART1 out	VA	Vertical Acquisition
SNDL-SC2-IN	Sound left SCART2 in	VA1	Vertical Sync (diversity)
SNDL-SC2-OUT	Sound left SCART2 out	VB-DEC	V-input for FDS
SNDL-SC3-IN	Sound left SCART3 in	VD	Vertical Drive coming from PICNIC
SNDL-SC4-IN	Sound left SCART4 in	VD-D	Vertical sync to FDS
SNDL-UI-IN	Sound left UI IN	V-DEC	V-dec (input signal for PICNIC)
SNDR-CL-VL-OUT	Sound R constant level, variable level out	VDEFL-1	Vertical deflection connection 1
		VDEFL-2	Vertical deflection connection 2
SNDR-FRONT-IN	Sound right front in	VDNEG	Negative vertical drive signal
SNDR-HEADPH-OUT	Sound right headphone out	VDPOS	Positive vertical drive signal
SNDR-SC1-IN	Sound right SCART1 in	+VD-switched	Only for VGA sets (VD-switched i.s.o. Vbat.
SNDR-SC1-OUT	Sound right SCART1 out	V-DS-1FH	V Dual Screen 1 X Horizontal Frequency
SNDR-SC2-IN	Sound right SCART2 out	V-DS-2FH	V Dual Screen 2 X Horizontal Frequency
SNDR-SC2-OUT	Sound right SCART2 out		
SNDR-SC3-IN	Sound right SCART3 in	V-DS-OUT	V Dual Screen out
SNDR-SC4-IN	Sound Right SCART4 IN	VFB	Vertical flyback pulse
SNDR-SC4-IN	Sound right SCART4 in	VF-DEC	V-MAIN input POPOV (Double Window PIP IC)
SNDS-CL-VL-OUT	Sound surround constant level, variable level out	V-FEAT	V-feature-box (output signal from PICNIC)
SNDS-VL-OUT	Surround sound left variable level out	VF-SUB	V-SUB input POPOV (Double Window PIP IC)
SNDS-VR-OUT	Surround sound right variable level out		
SOFAC	Sound and Fading Control	VGA-B	VGA Blue
SOUND L-HEADPHONE-OUT	Sound left headphone out	VGA-FBL	VGA Fast-blanking
SOUND R-HEADPHONE-OUT	Sound right headphone out	VGA-G	VGA Green
SOUND-ENABLE	Sound Enable	VGA-R	VGA Red
SOUND-SELECT	Sound signal Selection	VL_L	Variable level Left
SPDIF	Sony Philips Digital Interface Format	VL_R	Variable level Right
SPDIF_IN1	SPDIF In 1	VL_SL	Variable level - Surround Left
SPDIF_IN2	SPDIF In 2	VL_SR	Variable level - Surround Right
SS LEFT	Surround Sound Left	VL_SW	Variable Level Sub-Woofers
SS RIGHT	Surround Sound Right	VL_SW_DBE	Variable Level - Subwoofer- Dynamic Bass Enhancement
SSB	Small Signal Board		
SSM	Small Signal Module	VLL_C	Variable level Centre

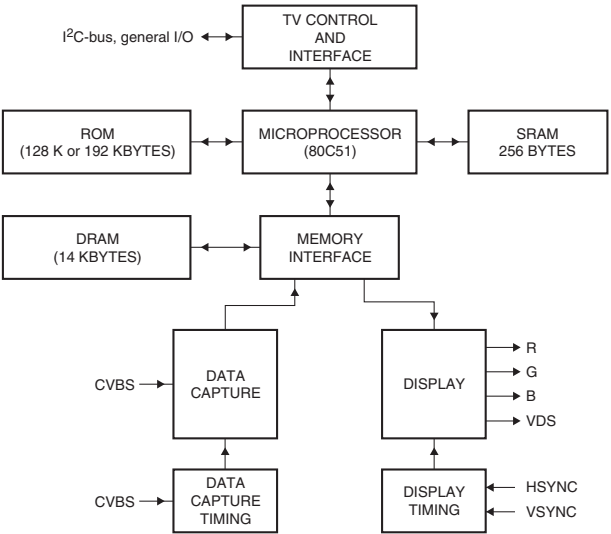
V-OUT	V-signal to HOP-IC
VOUT_C	V-out Centre
VOUT_L	V-out Left
VOUT_R	V-out Right
VOUT_SL	V-out Surround Left
VOUT_SR	V-out Surround Right
VOUT-SW	V-out Subwoofer
VREG	Opto-coupler feedback signal
VS-DS	Main, Vertical sync input POPOV (Double Window PIP IC)
V-SUB	V-output of HIP-IC on FDS
X-RAY-PROT	X-Ray Protection
X-tal	Crystal
Y_CVBS-SC2-IN	Luminance or CVBS SCART2 in
YB-DEC	Y-input for FDS
Y-DEC	Luminance-dec (input signal for PICNIC)
Y-DS-1FH	Y Dual Screen 1 X Horizontal Frequency
Y-DS-2FH	Y-Dual Screen 2 x Horizontal Frequency
Y-DS-OUT	Y Dual Screen out
YF-DEC	Y-MAIN input POPOV (Double Window PIP IC)
Y-FEAT	Luminance -feature-box (output signal from PICNIC)
YF-SUB	Y-SUB input POPOV (Double Window PIP IC)
Y-OUT	Luminance-signal to HOP-IC
Y-SUB	Y-output of HIP-IC on FDS
YUV-SELECT-2FH	YUV selection 2 x Horizontal Frequency

9.7 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.7.1 Diagram B7, SAA5667HL (IC7001)

Internal Block Diagram



Pin Configuration

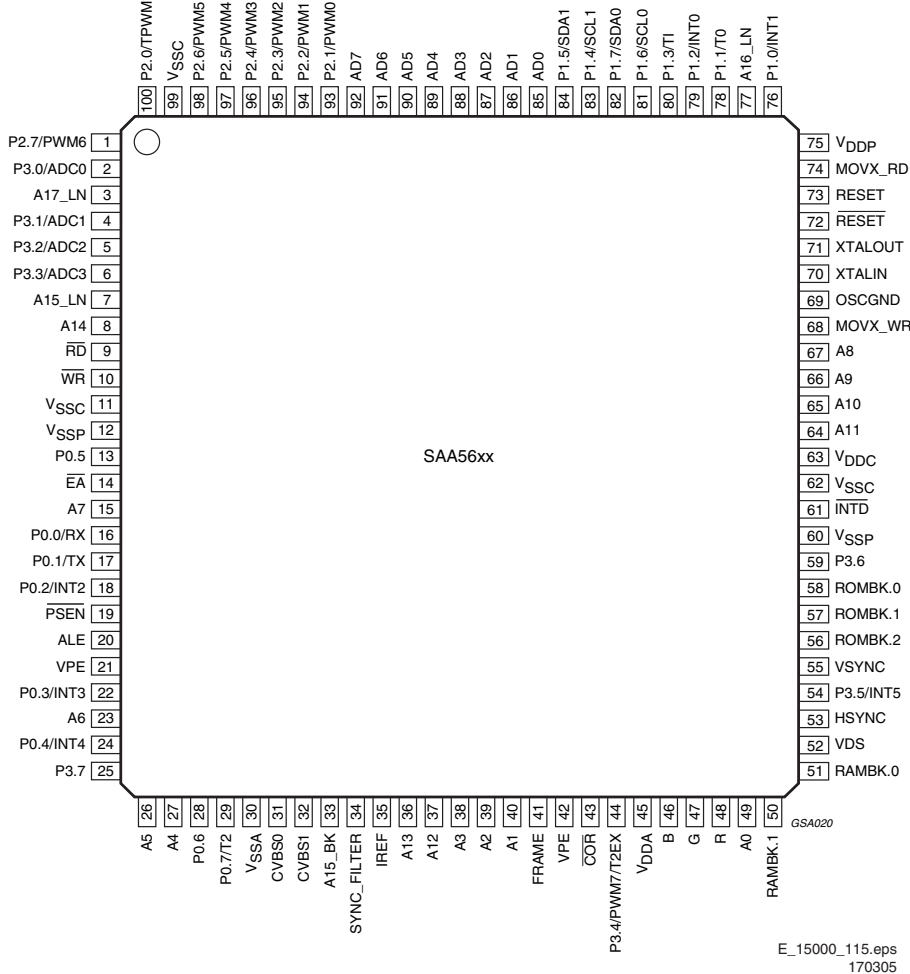


Figure 9-46 Internal Block Diagram and Pin Configuration

9.7.2 Diagram E1, MC44603A (IC7302)

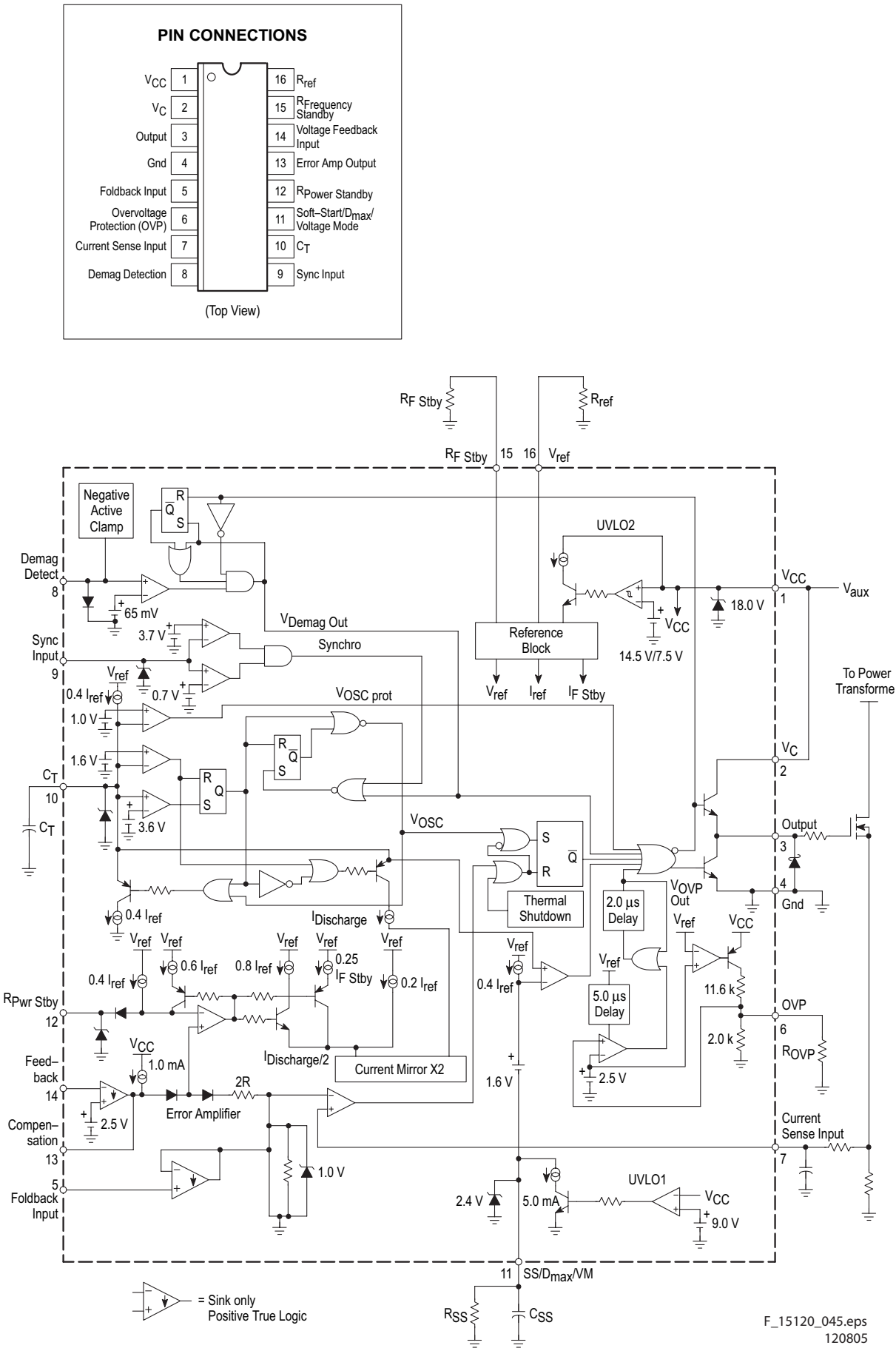


Figure 9-47 Internal Block Diagram and Pin Configuration

10. Spare Parts List

Notes:

- Not applicable.

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- Wiring diagram updated.

Manual xxxx xxx xxxx.2

- Chapters 4, 5, 8, and 9 completed.